



CONSUMER PRODUCT SAFETY COMMISSION

16 CFR Part 1610

[Docket No. CPSC-2019-0008]

Standard for the Flammability of Clothing Textiles; Notice of Proposed Rulemaking

AGENCY: Consumer Product Safety Commission.

ACTION: Notice of proposed rulemaking.

SUMMARY: The U.S. Consumer Product Safety Commission (Commission or CPSC) is proposing to amend the Standard for the Flammability of Clothing Textiles. The proposed revisions would clarify existing provisions, expand permissible equipment and materials, and update equipment requirements that are outdated. The Commission is providing an opportunity for interested parties to present written and oral comments on this notice of proposed rulemaking (NPR). Both written and oral comments will be part of the rulemaking record.

DATES: *Deadline for Written Comments:* Submit comments by **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

Deadline for Request to Present Oral Comments: Any person interested in making an oral presentation must send an e-mail indicating this intent to the Office of the Secretary at cpsc-os@cpsc.gov by **[INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Submit comments, identified by Docket No. CPSC-2019-0008, by any of the following methods:

Electronic Submissions: Submit electronic comments to the Federal eRulemaking Portal at: <https://www.regulations.gov>. Follow the instructions for submitting comments. CPSC typically does not accept comments submitted by electronic mail (e-mail), except as described below. CPSC encourages you to submit electronic comments by using the Federal eRulemaking Portal.

Mail/Hand Delivery/Courier Written Submissions: Submit comments by mail/hand delivery/courier to: Office of the Secretary, Consumer Product Safety Commission 4330 East West Highway, Bethesda, MD 20814; telephone: (301) 504-7479. If you wish to submit confidential business information, trade secret information, or other sensitive or protected information that you do not want to be available to the public, you may submit such comments by mail, hand delivery, or courier, or you may e-mail them to: cpsc-os@cpsc.gov.

Instructions: All submissions must include the agency name and docket number for this notice. CPSC may post all comments without change, including any personal identifiers, contact information, or other personal information provided, to: <https://www.regulations.gov>. Do not submit electronically: confidential business information, trade secret information, or other sensitive or protected information that you do not want to be available to the public. If you wish to submit such information, please submit it according to the instructions for mail/hand delivery/courier written submissions.

Docket: To read background documents or comments regarding this proposed rulemaking, go to: <https://www.regulations.gov>, insert docket number CPSC-2019-0008 in the “Search” box, and follow the prompts.

FOR FURTHER INFORMATION CONTACT: Paige Witzen, Project Manager, U.S.

Consumer Product Safety Commission, 5 Research Place, Rockville, MD 20852; telephone (301) 987-2029; e-mail: PWitzen@cpsc.gov.

SUPPLEMENTARY INFORMATION:

I. Background

A. History of the Standard for the Flammability of Clothing Textiles

Congress enacted the Flammable Fabrics Act (FFA; 15 U.S.C. 1191-1204) in 1953, to prohibit the importation, manufacture for sale, or the sale in commerce of any fabric or article of wearing apparel that is “so highly flammable as to be dangerous when worn by individuals.”¹

¹ Pub. L. No. 83–88, 67 Stat. 111 (June 30, 1953).

The FFA of 1953 required that a test, first published by the Department of Commerce as a voluntary commercial standard, then called “Flammability of Clothing Textiles, Commercial Standard 191–53” (CS 191-53), be used to determine if fabric or clothing is “so highly flammable as to be dangerous when worn by individuals.” In 1975, the Commission codified CS 191-53 as the Standard for the Flammability of Clothing Textiles at 16 CFR part 1610 (Standard). 40 FR 59884 (Dec. 30, 1975).² The Commission has since amended 16 CFR part 1610 several times to clarify requirements and update outdated materials, equipment, and technologies.³

B. The Current Standard

The purpose of the Standard is to reduce the risk of injury and death by providing a national standard for testing and rating the flammability of textiles and textile products used for clothing. 16 CFR 1610.1(a). The Standard includes test equipment, materials, and procedures for testing the flammability of clothing textiles. As a general overview,⁴ the Standard includes specifications for a flammability test apparatus, which consists of a chamber that contains an ignition mechanism, sample rack, and timing mechanism. The test procedure generally involves placing a specimen in the test apparatus, stringing stop thread across the top of the specimen, activating a trigger device that impinges a flame, and recording the time it takes to sever the stop thread and observations of the burn behavior of the specimen. This test is performed before and after refurbishing the specimen, which involves specified methods of dry cleaning and laundering, and must be performed on multiple specimens.

After testing, the burn time (*i.e.*, the time elapsed from ignition until the stop thread is severed) and burn behavior are used to identify appropriate test result codes (*i.e.*, burn codes) and

² In 1967, Congress amended the FFA to allow for rulemaking to issue flammability standards. Pub. L. No. 90–189, 67 Stat. 112 (Dec. 14, 1967). Congress transferred the authority to administer the FFA, including issuing regulations, to CPSC in 1972. 15 U.S.C. 2079(b).

³ *See, e.g.*, 59 FR 33193 (June 28, 1994) (removing the names of firms that supplied components of the test apparatus and equipment because additional firms had since entered the market); 73 FR 15636 (Mar. 25, 2008) (revising definitions and the test procedure to reduce confusion, updating test equipment and methods to reflect currently available materials, and revising burn codes to improve accuracy and consistency).

⁴ See 16 CFR part 1610 for details regarding test equipment, materials, and procedures, as well as exceptions.

determine the classification of the textile. Class 1 textiles exhibit normal flammability and are acceptable for use in clothing; Class 2 textiles exhibit intermediate flammability and may be used for clothing; and Class 3 textiles exhibit rapid and intense burning, are dangerously flammable, and are not permitted for clothing. The criteria for each classification differ for plain surface textile fabrics and raised surface textile fabrics.

Section 1610.40 of the Standard permits the use of alternative apparatus, procedures, or criteria for tests for guaranty purposes. The FFA states that no person will be subject to prosecution for failing to comply with flammability requirements if that person has a guaranty, meeting specific requirements, that indicates that reasonable and representative tests confirmed compliance with flammability requirements issued under the statute. 15 U.S.C. 1197. For purposes of supporting guaranties, § 1610.40(c) of the Standard states that “reasonable and representative tests” could be either the flammability tests required in the Standard or “alternate tests which utilize apparatus or procedures other than those” in the Standard. The Standard specifies that for persons or firms issuing guaranties to use an alternative apparatus or procedure, the alternative must be “as stringent as, or more stringent than” the test in the Standard, which the Commission will consider met “if, when testing identical specimens, the alternative test yields failing results as often as, or more often than,” the test in the Standard.

Section 1610.40 sets out conditions for using this allowance. A person or firm using the allowance “must have data or information to demonstrate that the alternative test is as stringent as, or more stringent than,” the test in the Standard, and retain that information while using the alternative and for one year after. 16 CFR 1610.40(d)(1), (2), (3), and (f). Section 1610.40 specifies that the Commission will test fabrics in accordance with the Standard and will consider any failing results evidence of non-compliance and a false guaranty. *Id.* 1610.40(e), (g).

C. History of this Rulemaking

In 2019, the Commission published a Request for Information (RFI), seeking information about the equipment and procedures in the Standard and possible ways to update those

provisions to reduce testing burdens, improve clarity, and reflect current industry practices and technologies. 85 FR 16797 (Apr. 23, 2019). The RFI requested information about the clarity of the test result codes, availability and clarity of the stop thread specification, restrictions on the dry cleaning solvent, and availability of machines meeting the laundering specifications in the Standard.⁵ Based on feedback received in response to the RFI, as well as CPSC staff's testing and other information, the Commission now proposes to amend the Standard to update and clarify these provisions.⁶ For additional details, see CPSC staff's briefing package supporting this notice.⁷

*D. The Product and Risk of Injury*⁸

The Standard applies to all items of clothing and fabrics intended to be used for clothing (*i.e.*, articles of wearing apparel), whether for adults or children, for daywear or nightwear,⁹ with certain listed exclusions.¹⁰

Between January 1, 2016, and December 31, 2020 (the most recent year for which data are available), there were an average of 81 deaths annually in the United States that involved ignition of clothing. An average of 2.2 of these fatalities involved ignition or melting of nightwear, and an average of 78.2 of these fatalities involved ignition or melting of other clothing. Between 2000 and 2020, the number of clothing fire deaths declined, overall. In

⁵ The RFI also sought input on the possibility of adding spandex to the list of fabrics that are exempt from testing requirements in 16 CFR part 1610. However, comments on the RFI and additional staff research did not provide sufficient information to justify such an exemption at this time. See *Status Update: 16 CFR Part 1610 Rule Update and Consideration for Adding Spandex Fibers to the List of Currently Exempted Fibers from Testing* (Sep. 30, 2020), available at: <https://www.cpsc.gov/s3fs-public/StatusUpdate-16CFRPart1610RuleUpdateandConsiderationforAddingSpandexFibers-to-the-List-of-Currently-Exempted-Fibers-from-Testing.pdf>.

⁶ The Commission voted 5-0 to issue this document.

⁷ Available at: https://www.cpsc.gov/s3fs-public/Proposed-Rule-to-Amend-the-Standard-for-the-Flammability-of-Clothing-Textiles-16-CFR-part-1610.pdf?VersionId=4QrYt7W05qY5gEiFf_ohdwT4j8.FGDoR.

⁸ For detailed information about the risk of injury, see Tab A of staff's briefing package supporting this document.

⁹ Other regulations governing the flammability of children's sleepwear, in 16 CFR parts 1615 and 1616, are more stringent than the general wearing apparel flammability standard in 16 CFR part 1610. The proposed changes discussed in this document would not affect the children's sleepwear standards.

¹⁰ Excluded products include certain hats, gloves, footwear, interlining fabrics, plain surface fabrics meeting specified criteria, and fabrics made from certain fibers that, from years of experience, have been shown to consistently yield acceptable results when tested in accordance with the Standard. 16 CFR 1610.1(c) and (d).

addition, using CPSC's National Electronic Injury Surveillance System (NEISS),¹¹ staff estimates that between January 1, 2017, and December 31, 2021 (the most recent year for which data are complete), there were an average of 5,300 nonfatal injuries annually that were associated with clothing ignition treated in U.S. hospital emergency departments.

II. Statutory Requirements for Revising the Standard

The FFA specifies the requirements for the Commission to issue or amend a flammability standard. The Commission may initiate rulemaking by issuing an advance notice of proposed rulemaking (ANPR) or an NPR. 15 U.S.C. 1193(g). The Commission is initiating this rulemaking with an NPR. The FFA requires that an NPR include the text of the proposed rule, any alternatives the Commission proposes, and a preliminary regulatory analysis. *Id.* 1193(i).

The preliminary regulatory analysis must include:

- a preliminary description of the potential benefits and costs of the proposed rule, including benefits and costs that cannot be quantified, and who is likely to receive the benefits and bear the costs;
- a discussion of the reasons the Commission did not publish any standard or portion of a standard submitted in response to an ANPR as the proposed rule or part of it;
- a discussion of the reasons for the Commission's preliminary determination that efforts submitted to the Commission in response to an ANPR to develop or modify a voluntary standard would not be likely, within a reasonable period, to result in a voluntary standard that would eliminate or adequately reduce the risk of injury at issue; and
- a description of reasonable alternatives to the proposed rule, a summary of their potential costs and benefits, and a brief explanation of the reasons the Commission did not choose the alternatives.

Id.

¹¹ NEISS uses a probability sample of about 100 hospitals in the United States that represent all U.S. hospitals with emergency departments to identify and generate national estimates of nonfatal injuries treated in emergency departments.

To issue a final rule, the Commission must publish a final regulatory analysis and make certain findings. *Id.* 1193(b), (j)(1), (j)(2). At the NPR stage, the Commission makes these findings on a preliminary basis to allow the public to comment on them. The Commission must find that each regulation or amendment:

- is needed to adequately protect the public from unreasonable risk of the occurrence of fire leading to death, injury, or significant property damage;
- is reasonable, technologically practicable, and appropriate;
- is limited to fabrics, related materials, or products that present such unreasonable risks; and
- is stated in objective terms.

Id. 1193(b). In addition, to promulgate a regulation, the Commission must make the following findings and include them in the rule:

- if a voluntary standard addressing the risk of injury has been adopted and implemented, that either compliance with the voluntary standard is not likely to result in the elimination or adequate reduction of the risk or injury, or it is unlikely that there will be substantial compliance with the voluntary standard;
- that the benefits expected from the rule bear a reasonable relationship to its costs; and
- that the rule imposes the least burdensome requirement that prevents or adequately reduces the risk of injury.

Id. 1193(j)(2).

When issuing an NPR under the FFA, the Commission also must comply with section 553 of the Administrative Procedure Act (APA; 5 U.S.C. 551-559), which requires the Commission to provide notice of a rule and the opportunity for interested parties to submit written data, views, or arguments on it. 5 U.S.C. 553(c); 15 U.S.C. 1193(d). In addition, the FFA requires the Commission to provide interested parties with an opportunity to make oral presentations of data, views, or arguments. *Id.* 1193(d).

III. Description of and Basis for the Proposed Revisions

A. Test Result Codes¹²

1. Current Requirements

As described above, the burn time and burn behavior of tested specimens are used to determine the classification of a textile, and classifications determine whether the fabric may be used for clothing. Section 1610.8 of the Standard lists test result codes (*i.e.*, burn codes) that are used to record burn time and burn behavior results and help determine the appropriate classification.¹³ The burn codes and classification criteria are different for plain and raised surface textile fabrics. Section 1610.2(l) and (k) define “plain surface textile fabrics” and “raised surface textile fabrics.” In general, plain surface textile fabrics do not have intentionally raised fiber or yarn surfaces, whereas, raised surface textile fabrics have intentionally raised fiber or yarn surfaces and consist of the base of the fabric, which is the fabric’s structure, and the surface fibers that are raised from the base. Common examples of raised surface textile fabrics include velvet or terry cloth.

For plain surface textile fabrics, classification is based primarily on burn times. The Standard provides three possible burn codes for plain surface textile fabrics:

- DNI (did not ignite);
- IBE (ignited, but extinguished); and
- __. __ sec. (indicating the burn time).

Fabrics that yield DNI or IBE burn codes have no recordable burn time and are considered Class 1 fabrics. Plain surface textile fabrics with a burn time of 3.5 seconds or more are Class 1; those

¹² For additional information regarding burn codes and the proposed revisions to them, see Tab B of staff’s briefing package supporting this notice.

¹³ Criteria for classifications are provided in Table 1 to § 1610.4, and in § 1610.7. Because multiple specimens must be tested under the Standard, both before and after refurbishing, burn codes and classifications are based on the results of multiple tested specimens. The Standard specifies how to determine appropriate burn codes and classifications in light of these multiple results. See §§ 1610.7 and 1610.8 for details on these determinations.

with a burn time of less than 3.5 seconds are Class 3; and there is no Class 2 option for plain surface fabrics.

For raised surface textile fabrics, classification is based on burn time and the intensity of the surface burning. Burn behaviors for raised surface textile fabrics fall into two general categories of intensity—surface flashes and base burns—and each category has specific burn codes associated with it. As described above, raised surface textile fabrics consist of a base and intentionally raised surface fibers. Burn behavior that involves only surface fibers is called surface flash, whereas, burn behavior that burns through the base is called a base burn, which involves the base fabric igniting or fusing. Both burn time and burn behavior are relevant to classification of these fabrics because a rapid surface flash that quickly breaks the stop thread but does not burn through the base of the fabric is not considered dangerously flammable; it is the combination of burning rapidly and through the base that results in a dangerously flammable fabric.

The Standard provides eight possible burn codes for raised surface textile fabrics:

- SF uc (surface flash under the stop thread);
- SF pw (surface flash part way, meaning it did not reach the stop thread);
- SF poi (surface flash at the point of impingement only);
- __. __ sec. (indicating the burn time);
- __. __ SF only (surface flash with a burn time);
- __. __ SFBB (surface flash with a base burn starting somewhere other than the point of impingement);
- __. __ SFBB poi (surface flash with base burn starting at the point of impingement); and
- __. __ SFBB poi* (surface flash with base burn where the base burn possibly started at the point of impingement, but testing was unable to make an absolute determination of the origin of the base burn).

Burn codes SF uc, SF pw, SF poi, and __ SF only apply when there is a surface flash and no base burn. Burn codes SFBB, SFBB poi, and SFBB poi* apply when the surface fiber and the base of the fabric are involved in the burning behavior (*i.e.*, both surface flash and base burn occur). Burn code __ sec. provides only the burn time, with no indication of burning behavior.

Raised surface textile fabrics are Class 1 if they either have a burn time greater than 7.0 seconds or they have a burn time of 0-7 seconds with no base burns (*i.e.*, the fabric exhibits only surface flash and no base burn). These fabrics are Class 2 if they have a burn time of 4 to 7 seconds (inclusive) and exhibit a base burn. These fabrics are Class 3 if they have a burn time of less than 4.0 seconds and exhibit a base burn.

2. Proposed Amendments and Rationale

The Commission proposes to update the burn code provisions in the Standard for raised surface textile fabrics to consolidate redundant codes, eliminate unnecessary and unclear codes, and to improve clarity. In response to the RFI, the Commission received several comments indicating that burn code information for raised surface textile fabrics is unclear. Because the burn codes help determine whether a fabric is permissible for use in clothing, a lack of clarity in these provisions could lead to misclassifications, which could impact consumer safety.

First, the Commission proposes several revisions to Table 1 to § 1610.4 to clarify the existing criteria for classifications of raised surface textile fabrics. In this table, the Commission proposes to replace the wording “with no base burns (SFBB)” in the Class 1 description with “with no SFBB burn code.” As the Class 1 description for raised surface fabrics in this table indicates, a fabric falls in this class only if it either has a longer burn time (more than 7 seconds) or if it exhibits rapid surface flash only, and no base burns. As explained above, there are three burn codes that indicate that a base burn occurred—SFBB, SFBB poi, and SFBB poi*. SFBB applies when the base burn occurs as a result of the surface flash, rather than from the point of impingement of the burner, whereas SFBB poi and SFBB poi* only have a base burn due to the flame that impinges on the fabric, not from the intensity of the surface of the fabric itself

burning. As such, only fabrics with burn code SFBB, and not SFBB poi and SFBB poi*, are excluded from being Class 1. The proposed revision would retain this criterion, while clarifying the specific burn code—SFBB—being referenced.

Similarly, the Commission proposes to add a note to Table 1 to § 1610.4, stating that burn codes SFBB poi and SFBB poi* are not considered a base burn for purposes of determining Class 2 and 3 fabrics. Class 2 and 3 descriptions for raised surface textile fabrics in this table specify that fabrics in these classes exhibit base burns (SFBB). Like above, only fabrics with a burn code of SFBB, and not SFBB poi and SFBB poi*, have a base burn that occurs as a result of the surface flash rather than from the point of impingement of the burner. Although the table already references burn code SFBB for the Class 2 and 3 descriptions, the added note will make clear that SFBB refers only to that specific code, and not the other two base burn codes.

The Commission also proposes to add the classification names—Normal Flammability, Intermediate Flammability, and Rapid and Intense Burning—to the descriptions of raised surface textile classifications in the table. This addition is both for clarity and to highlight that, although both Class 1 and 2 fabrics are permissible for use in clothing, Class 2 fabrics are more flammable, which indicates that caution should be taken when using them.

Second, consistent with the clarification above in § 1610.4, the Commission proposes to revise the definition of “base burn” in § 1610.2(a) to clarify that base burns are used to establish Class 2 and 3 (not just Class 3) and to reference burn code SFBB for clarity.

Third, and also consistent with the changes above, the Commission proposes to revise the description of Class 2 for raised surface textile fabrics in § 1610.4(b)(2) to add the clarification that “base fabric starts burning at places other than the point of impingement as a result of the surface flash (test results code SFBB).”

Fourth, the Commission proposes to amend the provisions on raised surface textile fabrics in § 1610.7(b)(3) and (4), which describes classification criteria in detail. The

Commission proposes to add “(SFBB)” anywhere that the words “base burn” appear to make clear what burn code is being referenced, consistent with the revision in Table 1 to § 1610.4.

Fifth, the Commission proposes to revise § 1610.8, which lists the burn codes and requirements relevant to them, to streamline the codes by consolidating similar codes and removing unnecessary and confusing codes. The Commission proposes to combine burn codes SF uc, SF pw, and SF poi into a single new burn code, SF ntr (no time recorded, does not break stop thread). The three existing codes all describe burning behavior that does not have enough intensity to break the stop thread and, accordingly, have no burn time and all result in a fabric being Class 1. Because the purpose of burn codes is to determine the classification of fabrics, it is unnecessary to have all three of these codes; instead, a single code, indicating that there was no burn time recorded, is sufficient and clearer.

Similarly, the Commission proposes to remove from the list of raised surface textile fabric burn codes in § 1610.8, the code that lists only a burn time (__. _ sec.). Because burn time, alone, generally does not determine the classification of raised surface textile fabrics, this code does not help identify the appropriate classification, is confusing, and may result in misclassification.

Finally, the Commission proposes to amend the times provided in the Standard so they all include one decimal place. Currently, some references to time use one decimal place (*e.g.*, 7.0 seconds) and others use no decimal place (*e.g.*, 4 seconds). For consistency, the Commission proposes to include a single decimal place, without altering the times specified in the Standard.

None of these proposed changes would alter the testing requirements, classification criteria, or classification results under the Standard. Rather, they clarify existing requirements and consolidate codes to streamline the provisions. The Commission requests comments on each of these proposed revisions and, in particular, on whether they improve clarity, as intended.

B. Stop Thread¹⁴

1. Current Requirements

As discussed above, the test apparatus required for flammability testing includes, as part of the necessary components, stop thread, which is used to determine burn time. Section 1610.2(p) includes a definition of “stop thread,” and § 1610.5(a)(2)(ii) specifies the test apparatus and materials that must be used for flammability testing, both of which state that the stop thread must be “No. 50, white, mercerized, 100% cotton sewing thread.”

2. Proposed Amendments and Rationale

CPSC has a supply of the required thread for testing. It is a 3-ply cotton thread. However, “No. 50” is not currently a common or clear method of describing thread. Lack of clarity or availability regarding the stop thread in the Standard potentially introduces variability in test results, depending on the thread testing laboratories use. This is problematic because the stop thread is used to determine burn time, which is used to determine the classification of a fabric and whether it is acceptable for use in clothing. The Standard needs to provide clear reference to a thread that is currently available on the market so that testing laboratories can acquire the necessary thread and use it to obtain consistent test results and classifications.

To identify a stop thread description that is available on the market and comparable to the current thread specified in the Standard, CPSC staff assessed the thread supply they currently use to test under the Standard, assessed an alternative thread that is marketed as complying with the Standard, considered threads required in other clothing flammability standards, and conducted testing of several threads. Currently, the industry (including internationally) commonly uses the Tex system to define thread size. “Tex” is defined as the weight, in grams, of 1,000 meters of yarn and is determined by measuring and weighing cotton threads and calculating linear density. Because of the wide recognition and use of the Tex system, staff considered the Tex size of the

¹⁴ For additional information regarding stop thread and the proposed revisions, see Tab C of staff’s briefing package supporting this notice.

various stop threads assessed. For a detailed explanation of how CPSC staff determined the Tex sizes of these threads, see the briefing package staff prepared following the RFI.¹⁵

Staff determined that the current thread supply CPSC uses to test under the Standard has a Tex size of 36. CPSC staff also assessed a commercially available thread (Item Code 1502002, CFR1610, #50 mercerized cotton thread, lot 12308) that is marketed as complying with the Standard. Although CPSC does not use this thread, some commercial laboratories and manufacturers use this thread when testing to the Standard. Staff determined that this thread has a Tex size of 44. Staff also considered the stop thread required in the Canadian General Standards Board's standard, CAN/CGSB-4.2 No. 27.5, *Textile Test Method Flame Resistance - 45° Angle Test – One Second Flame Impingement*. This stop thread specification is similar to the Standard and is described as R 35 Tex/3 (No.50, 3-ply), mercerized cotton, indicating a Tex size of 35.¹⁶ Based on these assessments, the thread CPSC currently uses, and potentially comparable threads on the market, have Tex sizes ranging from 35 to 44.

Staff conducted a thread comparison study to determine whether differences in threads, such as fiber type and size (linear density), had a significant effect on burn times and flammability classifications under the Standard, and to identify the range of Tex sizes that yield flammability results comparable to the current Standard. Because the purpose of updating the stop thread specification is to improve clarity about the thread required and ensure there is such a thread available on the market, and not to alter the results under the Standard, staff aimed to identify Tex sizes that would yield flammability results comparable to those using the thread currently specified in the Standard. This section provides information about the comparison study and results.

¹⁵ Tab B of staff's status update briefing package, "Status Update: 16 CFR Part 1610 Rule Update and Consideration for Adding Spandex Fibers to the List of Currently Exempted Fibers from Testing," Sep. 30, 2020, available at: <https://www.cpsc.gov/s3fs-public/StatusUpdate-16CFRPart1610RuleUpdateandConsiderationforAddingSpandexFibers-to-the-List-of-Currently-Exempted-Fibers-from-Testing.pdf>.

¹⁶ Staff also considered the stop thread required in ASTM International's standard, ASTM D1230-17, *Standard Test Method for Flammability of Apparel Textiles*. However, this standard describes the thread as "Cotton Sewing Thread, No. 50, mercerized" and, therefore, does not provide any further detail than the Standard.

Staff tested five threads with varying Tex sizes, as indicated in Table 1.

Table 1: Thread descriptions.

Thread	Description	Tex (g/1000 meters)
A	Thread CPSC uses to test to the Standard	36
B	Commercially available thread, sold as meeting the Standard	44
C	Polyester core spun thread	87
D	Spun polyester thread	24
E	Cotton thread	37

Threads A, B, and E were cotton, and Threads C and D were polyester and had more divergent Tex sizes than the cotton threads. Staff used two plain surface cotton fabrics for testing—cotton organdy (Fabric 1) and cotton batiste (Fabric 2)—each with a fabric weight of 2.06 oz/yd². Staff selected these fabrics for testing because they have burn times exceeding the 3.5-second burn time limit for plain surface textile fabrics in the Standard, had sufficient burn times (between 4 and 7 seconds) to yield a range of measurements for comparison, and did not produce many test result codes of DNI or IBE. Staff tested 30 specimens for each combination of thread and fabric.

Figures 1 and 2 provide the results of staff's testing.¹⁷

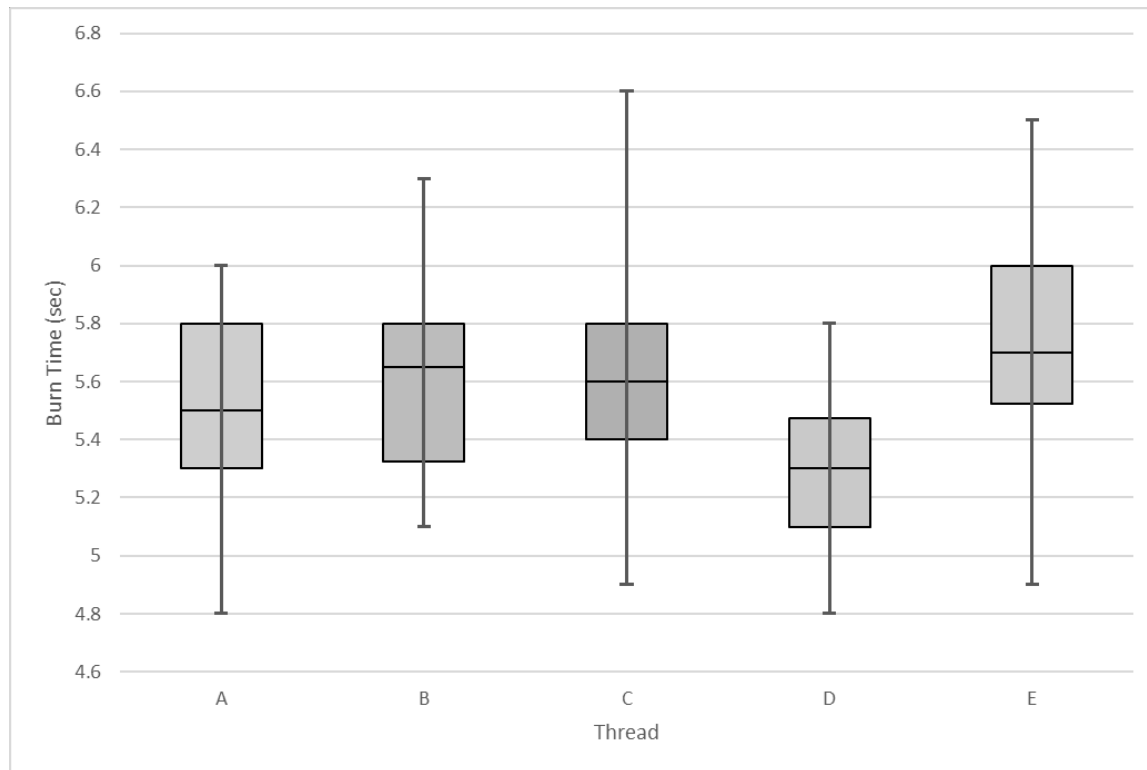


Figure 1: Burn times for Fabric 1 and Threads A through E.

¹⁷ Specimen results of DNI or IBE were excluded since these did not provide a burn time. These were excluded because this testing was designed to evaluate how sensitive the burn time measurements are to the properties of a stop thread.

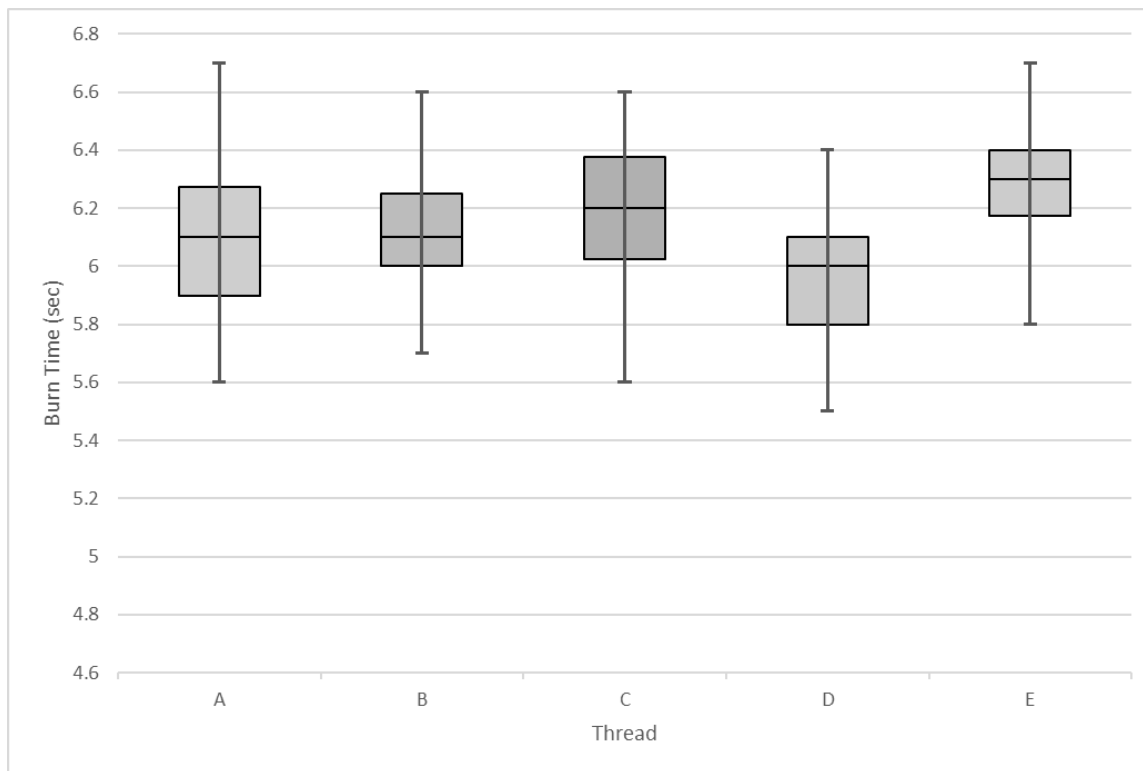


Figure 2: Burn times for Fabric 2 and Threads A through E.

As these figures show, the burn times for all of the thread options for each fabric were very similar. As explained above, for plain surface textile fabrics, classification depends on whether the burn time is 3.5 seconds or more, or shorter than that. For both fabrics, and all threads, the burn times were well above this 3.5-second threshold, indicating that all of the results were Class 1 and that any of the alternative threads would yield classifications consistent with the current Standard. In addition, because the burn times were all well above the 3.5-second threshold, slight variations in burn times across thread options would not alter the classifications. Moreover, there was little variation in the burn times of the different threads, with the median burn time for all threads being within 0.4 seconds for Fabric 1 and 0.3 seconds for Fabric 2. For comparison, the variability in burn times from specimen to specimen within the same fabric and thread type was wider, at about 1.0 second of variation between the slowest and fastest burn times. These results show that any of these alternative threads and Tex sizes would not result in changes in a fabric's classification when compared to the current Standard.

Based on staff's assessments and testing, the Commission proposes to amend the stop thread description in the Standard from "No. 50, white, mercerized, 100% cotton sewing thread," to state that it must consist of a spool of "3-ply, white, mercerized, 100% cotton sewing thread, with a Tex size of 35 to 45 Tex." This amendment would remove the reference to "No. 50" since the meaning of this is no longer clear, and it would add to the description that the thread is "3-ply" because this is consistent with thread that complies with the current Standard. This would also maintain the requirement that the thread be "white, mercerized, 100% cotton sewing thread," as this maintains consistency with the current Standard and does not require clarification or updates due to product availability. In addition, it is preferable to continue to require cotton for the stop thread because some polyester threads are designed to be flame resistant, making cotton thread more appropriate for flammability testing.

The Commission proposes to add to the description that the range of permissible Tex sizes is 35 to 45. Staff's test results indicate that a stop thread description that allows a range of acceptable Tex sizes would yield flammability results that are consistent across that range and in line with the results obtained using the stop thread in the current Standard. Because of the wide recognition and use of the Tex system, specifying a Tex size for the stop thread in the Standard would allow testing laboratories to purchase compliant thread and obtain repeatable and reliable test results. Allowing a range of Tex sizes, instead of specifying a specific Tex size, would give testing laboratories greater flexibility in identifying and obtaining stop threads that comply with the Standard, while retaining consistent burn times and flammability classifications.

The proposed range reflects the array of Tex sizes for the three cotton threads that yielded burn times that were consistent with the current Standard (Thread A with Tex size 36, Thread B with Tex size 44, and Thread E with Tex size 37). As such, the proposed revision would allow testing laboratories to use the thread CPSC currently uses (Thread A) and the thread currently marketed as complying with the Standard (Thread B), and it would also allow the use of thread that complies with the Canadian standard, which specifies a Tex size of 35. Although Threads C

and D also yielded comparable burn times, these two threads were polyester, which is potentially problematic because some polyester threads are designed to be flame resistant, and they had much higher and lower Tex sizes (87 and 24, respectively). Therefore, the Commission is not proposing to include these Tex size within the permissible range.

The Commission seeks comments on these proposed revisions and the justifications for them. In particular, the Commission seeks comments on the use of Tex sizes; whether a range of Tex sizes is appropriate, rather than a specific size; whether the range should be limited to those of cotton thread or include the Tex sizes of polyester or other thread; and the range of sizes that should be permissible and why.

C. Refurbishing¹⁸

1. Current Requirements and Need for Amendments

The Standard requires that flammability testing be performed on samples in their original state and again after refurbishing. 16 CFR 1610.3, 1610.6. The Standard defines “refurbishing” as “dry cleaning and laundering in accordance with § 1610.6.” *Id.* 1610.2(m). After testing samples in their original state, they must be dry cleaned following the procedures in § 1610.6(b)(1)(i), and then laundered (*i.e.*, washed and dried) following the procedures in § 1610.6(b)(1)(ii), before testing again. The purpose of the refurbishing requirements is to remove any non-durable or water-soluble treatments or finishes that are on the fabric that may affect the flammability of the fabric. These requirements are not meant to replicate how consumers would care for or use the garment. The specific requirements for dry cleaning and laundering, as well as the need for updating these provisions, are discussed below.

a. Dry Cleaning

The Standard defines “dry cleaning” as “the cleaning of samples in a commercial dry cleaning machine under the conditions described in § 1610.6.” *Id.* 1610.2(c). Section 1610.6

¹⁸ For additional information regarding refurbishing and the proposed revisions, see Tabs D and E of the briefing package supporting this NPR.

specifies that samples must be dry cleaned in a commercial dry cleaning machine using the solvent “perchloroethylene, commercial grade,” and it provides specific parameters regarding detergent class, cleaning time, extraction time, drying temperature, drying time, and cool down/deodorization time. *Id.* 1610.6(b)(1)(i). Likewise, the requirements regarding the test apparatus and materials specify that the dry cleaning solvent must be “perchloroethylene, commercial grade,” and the commercial dry cleaning machine must be capable of a complete automatic dry-to-dry cycle using perchloroethylene solvent. *Id.* 1610.5(b)(6), (b)(7).

In recent years, there have been increasing restrictions on the use of perchloroethylene in dry cleaning. In 2007, California adopted regulations that took incremental steps to phase out the use of perchloroethylene in the dry cleaning industry over time, and require that, by January 1, 2023, existing facilities remove all perchloroethylene dry cleaning machines from service.¹⁹ In addition, the U.S. Environmental Protection Agency has announced that it is considering steps to address the risks associated with perchloroethylene, including potentially regulating, limiting, or prohibiting production or use of the chemical.²⁰ With increasing limitations on the use of perchloroethylene in dry cleaning, the Standard needs to be updated to include an alternative dry cleaning specification so that testing laboratories that cannot use perchloroethylene can conduct compliant testing and obtain consistent, reliable, and accurate test results and classifications.

b. Laundering

The Standard defines “laundering” as “washing with an aqueous detergent solution and includes rinsing, extraction and tumble drying as described in § 1610.6.” 16 CFR 1610.2(i). Section 1610.6 specifies that, for laundering, a sample be washed and dried one time in accordance with sections 8.2.2, 8.2.3, and 8.3.1(A) of AATCC Test Method 124-2006, *Appearance of Fabrics after Repeated Home Laundering* (TM 124-2006), which is incorporated

¹⁹ See 17 CA ADC section 93109, available at: [https://govt.westlaw.com/calregs/Document/I3065E480D60811DE88AEDDE29ED1DC0A?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/calregs/Document/I3065E480D60811DE88AEDDE29ED1DC0A?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)).

²⁰ See EPA Releases Final Chemical Risk Evaluation for Perchloroethylene (Dec. 14, 2020), available at: <https://www.epa.gov/chemicals-under-tsca/epa-releases-final-chemical-risk-evaluation-perchloroethylene>.

by reference into the regulations in section 1610.6(b)(1)(iii). Sections 8.2.2 and 8.2.3 of TM 124-2006 address washing requirements, and section 8.3.1(A) addresses drying.

For washing, the Standard requires the use of specific washing procedures (by referencing sections 8.2.2 and 8.2.3 of TM 124-2006); the use of washing machines that meet criteria for wash temperature (by referencing Table II, provision (IV) in TM 124-2006) and water level, agitator speed, washing time, spin speed, and final spin cycle (by referencing Table III, provisions for “Normal/Cotton Sturdy” in TM 124-2006); and maximum wash loads and contents. For drying, the Standard requires the test method described in TM 124-2006 for Tumble Dry (section 8.3.1(A)), with the use of machines that meet specified exhaust temperatures and cool down temperatures (by referencing Table IV, provisions for “Durable Press” in TM 124-2006).

Washing machines have changed substantially over the past 15 years to reduce water use and improve energy efficiency. One key element of washing machines that has evolved is agitation speed. Currently, the Standard requires the use of a washing machine with an agitation speed of 179 ± 2 strokes per minute (spm) (by referencing Table III, provisions for “Normal/Cotton Sturdy” in TM 124-2006). However, washing machines available on the market are no longer able to meet this requirement because they have reduced agitation speeds. Although CPSC still has washing machines that meet the required agitation speed, when these machines reach the end of their useful lives, CPSC will not be able to replace them with machines that comply with the Standard. Likewise, CPSC expects that many washing machines that testing laboratories use to test for conformance with the Standard have reached, or soon will reach, the end of their useful lives, at which point, the labs will be unable to obtain the machines necessary to test to the Standard. As such, the Standard needs to be updated to include washing machine specifications that can be met by machines that are available on the market, and yield consistent, reliable, and accurate test results and classifications.

Unlike washing machines, there has been little change in the design of dryers in recent years, and dryers that meet the requirements in the Standard are still available on the market. Nevertheless, the Commission proposes to update the specifications for dryers in the Standard to align with the necessary updates for washing machines, for the reasons discussed below.

2. Comparison Study

Staff considered several options to update the dry cleaning and laundering specifications in the Standard and conducted comparison testing to determine whether these options would yield flammability results comparable to the current Standard. Staff sought to identify options that would not alter the flammability results of fabrics because the Standard has a long history and has been effective at addressing clothing flammability. As such, staff aimed to identify alternatives that would provide a comparable level of consumer safety, by providing comparable flammability classifications. In addition, alternatives that provide flammability results comparable to the Standard, reduce the costs associated with these updates because they would not change whether fabrics subject to the Standard are permissible for use in clothing. Finally, staff sought to identify comparable alternatives because the purpose of these amendments is to update outdated equipment and methods, not to alter the classifications of fabrics tested under the Standard.

This section provides information about the comparison study and results; for additional information, see Tabs D and E of staff's briefing package supporting this NPR.

a. Options

i. Dry Cleaning

Staff considered several dry cleaning solvents as alternatives to perchloroethylene. Staff considered hydrocarbon solvent because it is becoming the most commonly used alternative to perchloroethylene in the dry cleaning industry; it has a long history of use; it is low in cost; and it is more widely available than many other alternatives. Staff also considered silicone and butylal solvents because they are also widely available. Staff did not consider carbon dioxide dry

cleaning because it is more expensive than other options and is not widely available. Staff also did not consider professional wet cleaning because it would not accomplish the purpose of the dry cleaning requirement in the Standard. The purpose of the refurbishing requirements in the Standard is to remove finishes that may affect the flammability of a fabric, and both dry cleaning and laundering are necessary for that purpose. Because fabrics are already exposed to water-based cleaning under the separate laundering requirements in the Standard, water-soluble finishes would be removed by that process, and professional wet cleaning would not provide additional finishing removal. As such, a non-water-based dry cleaning method, like the one currently in the Standard, is appropriate. Based on these assessments, staff tested three potential dry cleaning solvent options—hydrocarbon, silicone, and butylal—as part of the comparison study.

In selecting an alternative dry cleaning solvent for the Standard, it is not sufficient to change the solvent alone; the parameters surrounding the dry cleaning procedure need to be adjusted, as well, because of the nature of different solvent systems, dry cleaning processes, and equipment requirements. As such, in assessing alternative procedures, staff selected an appropriate detergent class, cleaning time, extraction time, cooling time, drying time, and drying temperature, for each alternative solvent, based on typical procedures used for that solvent system. For all of the options, samples were dry cleaned in a commercial dry cleaning machine at 80 percent of the machine's capacity.²¹ The parameters staff used for the comparison study are in Table 2.

²¹ Consistent with § 1610.6(b)(1)(i)(B), staff used 80 percent wool and 20 percent cotton ballast, in addition to the sample, to achieve 80 percent of the machine's capacity.

Table 2: Dry cleaning procedures used in comparison study.

Solvent	Perchloroethylene	Hydrocarbon	Silicone	Butylal
Detergent Class	Cationic	Cationic	Anionic	Cationic
Cleaning Time	10-15 minutes	20-25 minutes	14-17 minutes	2 mins (bath 1) 11 minutes (bath 2) (13 minutes total)
Extraction Time	3 minutes	4 minutes	6 minutes	5 minutes (bath 1) 5 minutes (bath 2) (10 minutes total)
Drying Temperature	60-66°C (140-150°F)	60-66°C (140-150°F)	70°C (158°F)	66-71°C (150-160°F)
Drying Time	18-20 minutes	20-25 minutes	18-20 minutes	40 minutes
Cool Down/ Deodorization Time	5 minutes	5 minutes	5 minutes	4 minutes

ii. Laundering

Staff also considered several options as alternatives to the laundering specifications in TM 124-2006. Because agitation speed is the primary element of the current specification that can no longer be met by machines on the market, one alternative staff considered was requiring the continued use of the laundering procedures in TM 124-2006, but allowing a lower agitation speed.²² Staff considered this option because it is the alternative most similar to the current Standard—with all of the washing parameters remaining the same except for agitation speed—that washing machines on the market can meet. When comparison testing this option, the agitation speed was the only washing parameter changed from the current Standard, and the drying procedures remained the same as the current Standard.

To assess this lower agitation speed option, CPSC purchased a washing machine designed for testing laboratories that offers preprogrammed wash cycles or allows the user to program cycle parameters, subject to the machine's physical specification limits. All of the machine's programmable cycle parameters can meet the specifications in the Standard, except for the agitation speed. The maximum programmable agitation speed for the washing machine is

²² Agitation speed alone is not a measure of how rough a wash cycle is on textiles. Rather, agitation speed and stroke length need to be considered in combination when comparing washing parameters. Stroke length is a measurement of the degrees of rotation of the agitator. However, in considering this alternative, staff did not alter the stroke length because, although older washing machines have higher agitation speeds, they also typically have lower stroke lengths (typically up to 90 degrees). In contrast, washing machines currently on the market, which have lower agitation speeds, also have larger stroke lengths (typically up to 220 degrees), thereby achieving the same wash results with lower agitation speeds.

120 spm, lower than the 179 ± 2 spm required in the Standard. This option is referred to as “reduced agitation speed” in this notice because it has a reduced agitation speed, as compared to the Standard (although the agitation speed is higher than the second option, discussed below).

A second option staff considered to update the washing machine specifications was to follow the parameters in AATCC’s Laboratory Procedure 1, *Home Laundering: Machine Washing* (LP1-2021), instead of the parameters in TM 124-2006. LP1-2021 is a voluntary standard that many testing laboratories already use for testing to other standards. A comment on the RFI recommended the use of this standard because it is similar to the current Standard; machines that meet it are readily available on the market; and the machines and standard are not expected to change significantly for some time.

LP1-2021 includes a lower agitation speed than the current Standard, but it also includes other differences in the washing and drying parameters. For this alternative, staff conducted comparison testing using washing machine parameters that conform to the provisions in:

- section 9.2 of LP1-2021, which includes a lower wash load size of 1.8 ± 0.1 kg (4.0 ± 0.2 pounds), compared to the current Standard;
- section 9.4 of LP1-2021, which requires the same detergent as the current Standard; and
- “(1) Normal” and “(IV) Hot” in Table 1, *Standard Washing Machine Parameters*, of LP1-2021, which specify the water level, agitation rate, stroke length, washing time, final spin speed and time, and wash temperature.

Staff used the drying parameters that conform to the provisions in:

- section 12.2(A) of LP1-2021, which are the same as those in the current Standard; and
- “(Aiii) Permanent Press” in Table VI, *Standard Tumble Dryer Parameters*, of LP1-2021, which specifies the maximum exhaust temperature and cool down time.

Based on these assessments, staff tested two potential laundering options as part of the comparison study. The first option was the reduced agitation speed for laundering (*i.e.*, the laundering specification in TM 124-2006, but with a reduced agitation speed) and the drying

specifications in the Standard. The second was both the laundering and drying specifications stated above in LP1-2021. Note that when this notice references LP1-2021, it is referring only to the specific sections and tables stated above (*i.e.*, sections 9.2, 9.4, 12.2(A), Table 1 ((I) Normal and (IV) Hot), and Table VI ((Aiii) Permanent Press)), and not the entire LP1-2021 standard, which includes additional and alternative provisions. Table 3 provides a comparison of the washing and drying parameters in the current Standard, and the two alternatives staff assessed in comparison testing.

Table 3. Laundering procedure parameters.

	Standard	Reduced Agitation Speed	LP1-2021
Washing Machine Parameters			
Agitation Speed, spm	179 ± 2	120 ± 2	86 ± 2
Water Level, L (gal)	68 ± 4 (18 ± 1)	68 ± 4 (18 ± 1)	72 ± 4 (19 ± 1)
Washing Time, min	12	12	16 ± 1
Spin Speed, rpm ²³	645 ± 15	645 ± 15	660 ± 15
Final Spin Time, min	6	6	5 ± 1
Wash Temperature, °C (°F)	49 ± 3 (120 ± 5)	49 ± 3 (120 ± 5)	49 ± 3 (120 ± 5)
Load size, kg (lbs)	≤ 3.63 (≤ 8)	≤ 3.63 (≤ 8)	1.8 ± 0.1 (4 ± 0.2)
AATCC 1993 Standard Reference Detergent, g (oz)	66 ± 0.1 (2.3 ± 0.004)	66 ± 0.1 (2.3 ± 0.004)	66 ± 1 (2.3 ± 0.004)
Dryer Parameters			
Max. Dryer Exhaust Temperature, °C (°F)	66 ± 5 (150 ± 10)	66 ± 5 (150 ± 10)	68 ± 6 (155 ± 10)
Cool Down Time, min	10	10	≤10

b. Test Methods

To identify options that would yield flammability results comparable to the Standard, staff developed a comparison testing study that assessed the three alternative dry cleaning solvent options and the two alternative laundering options discussed above, in comparison to the dry cleaning and laundering provisions in the Standard.

Staff selected 11 fabrics for testing, including six plain surface textile fabrics and five raised surface textile fabrics. Staff included both plain and raised surface textile fabrics in the study because the Standard provides different criteria for classifying these fabric types. Staff

²³ “Rpm” refers to revolutions per minute.

chose samples that are representative of fabrics that typically require flammability testing²⁴ and yield both results that permit their use in clothing (Class 1 and 2) and do not (Class 3). Table 4 lists the fabrics used in the comparison study, as well as their characteristics.

Table 4. Fabrics used in comparison study.

Fabric	Description	Fabric Weight (oz/yd ²)	Surface Type	Approximate Fabric Width (cm)
A	Silk, Chiffon, White	0.58	Plain	112
B	Silk, Habutae, White	1.06	Plain	114
C	Silk, Chiffon, Black	0.87	Plain	112
D	Rayon, Chiffon, white	2.0	Plain	137
E	Cotton, Batiste	2.06	Plain	114
F	Cotton, Organdy	2.06	Plain	152
G	Cotton, Brushed, White	7.24	Raised	100
H	Cotton Terry	9.02	Raised	152
I	Cotton, Chenille, White	10.0	Raised	142
J	Cotton, Chenille, Black	10.0	Raised	142
K	Rayon, Brushed, Black	3.08	Raised	152

Staff purchased at least 14 yards of each fabric, with widths between 40 and 60 inches, and they cut these into four 2-yard sections and one 6-yard section. One of the 2-yard sections of each fabric was tested in its original state, without refurbishing, in accordance with the Standard.

To examine the dry cleaning options, each of the three 2-yard sections for each fabric was dry cleaned using one of the three dry cleaning procedures under consideration (*i.e.*, hydrocarbon, silicone, and butylal), and then laundered using the procedures required in the Standard. Staff used the laundering method in the Standard so that only one variable in the refurbishing process was changed (*i.e.*, dry cleaning), to allow clear comparisons of the effects of different dry cleaning methods on flammability test results.

To examine the laundering options, the 6-yard section of each fabric was dry cleaned in perchloroethylene, in accordance with the Standard, and then cut into three 2-yard sections, each

²⁴ Staff excluded fabrics that are exempt from flammability testing under the Standard. Staff also excluded blends from the study, for simplicity.

of which underwent one of the three laundering procedures under consideration (*i.e.*, the Standard, reduced agitation speed, and LP1-2021). Staff used the dry cleaning method in the Standard so that only one variable in the refurbishing process was changed (*i.e.*, laundering), to allow clear comparisons of the effects of different laundering methods on flammability test results.

After these refurbishing procedures, staff cut each 2-yard section (including the 6 refurbished sections and 1 section in its original state) into thirty 2-by-6-inch specimens and performed flammability testing on those specimens, in accordance with the Standard. In total, this resulted in staff testing 2,310 specimens ($11 \text{ fabrics} \times 7 \text{ sections of each fabric} \times 30 \text{ specimens of each sample}$).²⁵ Staff recorded the burn times and applicable burn codes for each specimen.

c. Results

Overall, the results of the comparison study indicate that all of the alternative dry cleaning specifications and laundering specifications yield flammability results comparable to the Standard. Key results for the dry cleaning and laundering alternatives are provided in this section.

In understanding these results, it is important to note that, under the Standard, multiple specimens of a fabric must be tested, and burn codes and classifications are based on the results of these multiple specimens. The Standard specifies how to determine appropriate burn codes and classifications in light of these multiple specimens. Typically, fabric classification is determined by testing at least five specimens of a fabric. Thus, the results of a single specimen of fabric are not necessarily indicative of the final classification of the fabric. For example, if the results of a single specimen meet the criteria for Class 2 (*i.e.*, burn time of 4.0 to 7.0 seconds, with a burn code of SFBB), the final classification of the fabric may not be Class 2 because the

²⁵ Staff tested 11 fabrics, which were each divided into seven sections (1 original state, 3 for dry cleaning options, and 3 for laundering options), which were each divided into 30 specimens.

final classification will depend on the results of the additional specimens of that fabric.

Accordingly, the final classification of some fabrics discussed in this section cannot always be determined by the results presented here, but the range of possible classifications is determined.

Particularly because the comparison testing assessed multiple specimens of the tested fabrics, these results provide a good indication of the final classification of the fabrics.

i. Dry Cleaning

The comparison study results for the three alternative dry cleaning specifications and the dry cleaning specifications in the Standard are presented below. Table 5 provides the aggregated results for all plain surface textile fabrics. Table 6 provides the results for the individual plain surface textile fabrics and includes the number of samples tested that resulted in burn times,²⁶ mean burn times, standard deviations, minimum burn times, and maximum burn times.

Table 5. Burn times for plain surface textile fabrics, aggregated, by dry cleaning procedure.

Procedure	Number of Samples with a Burn Time	Mean Burn Time	Standard Deviation	Minimum Burn Time	Maximum Burn Time
Standard	104	6.15 seconds	0.77	4.70 seconds	8.10 seconds
Hydrocarbon	94	6.05 seconds	0.88	4.90 seconds	9.40 seconds
Silicone	86	6.15 seconds	0.88	4.80 seconds	8.90 seconds
Butylal	115	6.09 seconds	0.77	4.80 seconds	7.90 seconds

Table 6. Burn times for plain surface textile fabrics (A through F), by dry cleaning procedure.

Procedure	Number of Samples with a Burn Time	Mean Burn Time	Standard Deviation	Minimum Burn Time	Maximum Burn Time
Fabric A					
Standard	26	6.75 seconds	0.50	5.90 seconds	7.90 seconds
Hydrocarbon	16	6.83 seconds	0.37	6.20 seconds	7.60 seconds
Silicone	4	6.85 seconds	0.50	6.30 seconds	7.50 seconds
Butylal	27	6.31 seconds	0.30	5.70 seconds	6.80 seconds
Fabric B					
Standard	16	6.49 seconds	0.26	6.00 seconds	7.00 seconds
Hydrocarbon	9	6.53 seconds	0.35	6.10 seconds	7.00 seconds
Silicone	6	7.52 seconds	0.26	7.10 seconds	7.90 seconds
Butylal	7	7.29 seconds	0.43	6.70 seconds	7.90 seconds
Fabric C					
Standard	28	5.24 seconds	0.38	4.70 seconds	6.10 seconds

²⁶ Although staff tested 30 specimens of each fabric/procedure combination, the number of samples with results in Tables 5 and 6 is not 30 because only samples with burn times, rather than DNI results, are provided in these tables. For DNI results, see Tab E of the briefing package supporting this NPR.

Hydrocarbon	29	5.28 seconds	0.32	4.90 seconds	6.60 seconds
Silicone	29	5.25 seconds	0.27	4.80 seconds	5.90 seconds
Butylal	3	5.38 seconds	0.34	4.90 seconds	6.60 seconds
Fabric D					
Standard	24	6.03 seconds	0.41	5.20 seconds	7.50 seconds
Hydrocarbon	27	5.62 seconds	0.28	4.90 seconds	6.20 seconds
Silicone	23	6.13 seconds	0.44	5.40 seconds	6.80 seconds
Butylal	27	5.54 seconds	0.40	4.80 seconds	6.20 seconds
Fabric E					
Standard	4	7.03 seconds	0.72	6.60 seconds	8.10 seconds
Hydrocarbon	4	7.58 seconds	1.22	6.80 seconds	9.40 seconds
Silicone	3	7.23 seconds	0.32	7.00 seconds	7.60 seconds
Butylal	6	6.98 seconds	0.29	6.70 seconds	7.50 seconds
Fabric F					
Standard	6	6.92 seconds	0.69	6.30 seconds	8.10 seconds
Hydrocarbon	9	7.23 seconds	0.66	6.40 seconds	8.10 seconds
Silicone	21	6.73 seconds	0.72	5.50 seconds	8.90 seconds
Butylal	18	6.99 seconds	0.40	6.40 seconds	7.90 seconds

As Table 5 shows, for plain surface textile fabrics, all three of the alternative dry cleaning options yielded very similar burn times to the Standard, including the mean, minimum, and maximum burn times. Table 6 shows the same is true for each plain surface textile fabric tested, with very similar mean, minimum, and maximum burn times for each alternative and the dry cleaning specification in the Standard.

For plain surface textile fabrics, burn time alone determines a fabric's classification, and a burn time of 3.5 seconds or more is Class 1, while a burn time of less than 3.5 seconds is Class 3. As Tables 5 and 6 show, for both the aggregated results and the individual fabric results, the Standard and all three alternative dry cleaning procedures yielded mean, minimum, and maximum burn times above the 3.5 second threshold and, therefore, yielded the same classification—Class 1—for all of the fabrics. Moreover, the mean, minimum, and maximum burn times were all sufficiently above the 3.5-second threshold that, even with some variability in burn times, the alternatives would not alter the classifications of these fabrics, when compared to the classifications under the Standard.²⁷ This demonstrates that, for plain surface textile

²⁷ Staff also considered the extent to which each of the three alternative dry cleaning options yielded DNI results versus burn times, as compared to the Standard. For plain surface textile fabrics, DNI results generally result in a fabric being Class 1. Because all of the plain surface textile fabrics in the comparison study of dry cleaning options yielded either DNI results or burn times of more than 3.5 seconds, they were all Class 1. Consequently, the results of

fabrics, all three alternative dry cleaning procedures yield flammability results comparable to the Standard.

Table 7 provides the aggregated results for all raised surface textile fabrics, and Table 8 provides the results for the individual raised surface textile fabrics.

Table 7. Burn times for raised surface textile fabrics, aggregated, by dry cleaning procedure.

Procedure	Number of Samples with a Burn Time	Mean Burn Time	Standard Deviation	Minimum Burn Time	Maximum Burn Time
Standard	150	11.87 seconds	7.45	2.30 seconds	27.30 seconds
Hydrocarbon	150	11.01 seconds	7.65	1.60 seconds	27.80 seconds
Silicone	150	10.57 seconds	7.08	1.90 seconds	32.70 seconds
Butylal	150	10.34 seconds	6.56	1.80 seconds	27.70 seconds

Table 8. Burn times for raised surface textile fabrics (G through K), by dry cleaning procedure.

Procedure	Number of Samples with a Burn Time	Mean Burn Time	Standard Deviation	Minimum Burn Time	Maximum Burn Time
Fabric G					
Standard	30	19.66 seconds	2.25	16.60 seconds	27.30 seconds
Hydrocarbon	30	16.77 seconds	2.55	11.10 seconds	25.10 seconds
Silicone	30	15.91 seconds	1.32	13.60 seconds	19.20 seconds
Butylal	30	13.72 seconds	1.59	8.20 seconds	15.80 seconds
Fabric H					
Standard	30	21.16 seconds	2.62	16.00 seconds	26.00 seconds
Hydrocarbon	30	22.25 seconds	3.10	13.30 seconds	27.80 seconds
Silicone	30	20.60 seconds	5.00	13.90 seconds	32.70 seconds
Butylal	30	20.76 seconds	2.83	15.00 seconds	27.70 seconds
Fabric I					
Standard	30	7.18 seconds	1.45	5.00 seconds	12.70 seconds
Hydrocarbon	30	5.91 seconds	1.45	4.00 seconds	8.80 seconds
Silicone	30	6.00 seconds	1.13	4.30 seconds	10.10 seconds
Butylal	30	6.53 seconds	1.21	4.80 seconds	9.00 seconds
Fabric J					
Standard	30	2.84 seconds	0.28	2.30 seconds	3.40 seconds
Hydrocarbon	30	2.23 seconds	1.60	1.60 seconds	3.20 seconds
Silicone	30	2.60 seconds	1.90	1.90 seconds	4.20 seconds
Butylal	30	2.48 seconds	1.80	1.80 seconds	3.30 seconds
Fabric K					
Standard	30	8.51 seconds	0.77	7.10 seconds	10.50 seconds
Hydrocarbon	30	7.88 seconds	0.88	6.60 seconds	10.50 seconds
Silicone	30	7.74 seconds	0.69	6.50 seconds	9.40 seconds
Butylal	30	8.18 seconds	0.88	6.00 seconds	10.40 seconds

DNI versus burn times for these fabrics are not presented here, since they do not alter the classifications. Moreover, it is expected that there will be variation in whether multiple specimens yield DNI or burn time results even when they are specimens of the same fabric that underwent the same refurbishing procedure. For details on these results, see Tab E of the briefing package supporting this NPR.

As Table 7 shows, for raised surface textile fabrics, all three of the alternative dry cleaning options yielded burn times very similar to the Standard, including the mean, minimum, and maximum burn times. Table 8 shows the same is true for each raised surface textile fabric tested, with similar mean, minimum, and maximum burn times for each alternative and the dry cleaning specification in the Standard. Tables 7 and 8 also illustrate the wide variability in burn times for raised surface textile fabrics, even when testing the same fabric with the same dry cleaning procedure. This variation is expected, particularly for raised surface textile fabrics, both within results for a single fabric and across different fabric types.

For raised surface textile fabrics, classifications are generally based on both burn time and burn behavior, as indicated by burn codes.²⁸ However, one classification for raised surface textile fabrics is based solely on burn time—specifically, a raised surface textile fabric is Class 1 if it has an average burn time greater than 7.0 seconds, regardless of burn behavior. For raised surface textile fabrics with an average burn time of 7.0 seconds or less, classifications depend on both burn behavior and burn time. If a fabric has an average burn time of 7.0 seconds or less and does not have a burn code of SFBB, then it is Class 1. If it has an average burn time of 4.0 to 7.0 seconds, and multiple specimens of the fabric have a burn code of SFBB, then it is Class 2. If it has an average burn time of less than 4.0 seconds, and multiple specimens have a burn code of SFBB, then it is Class 3. As discussed in the proposed revisions to burn codes, above, only a burn code of SFBB—not SFBB poi or SFBB poi*—determines the classification of the fabric.

As the results in Table 7 show, using the mean burn times, all of the alternative dry cleaning procedures yielded the same Class 1 results as the Standard. These mean results were also sufficiently above the 7.0-second threshold that, even with some variability in burn times, the alternatives would not alter the classifications when compared to the classifications under the Standard. The wide range of minimum and maximum burn times in Table 7 is the result of

²⁸ See 16 CFR 1610.7 for details on requirements for testing multiple specimens of a fabric and determining classifications based on the results of those multiple specimens.

variations in different raised surface textile fabrics. The results of individual fabrics are discussed below.

The results for Fabric G, in Table 8, show that the mean, minimum, and maximum burn times for this fabric were all above the 7.0-second threshold and, therefore, Class 1, using any of the three alternatives or the Standard. Even with some variability in burn times, the burn times were sufficiently above the 7.0-second threshold that this would not alter the classifications. In addition, staff found that all of the specimens tested under the three alternatives and the Standard yielded burn codes of SFBB poi. The same is true of the burn time and burn code results for Fabric H, in Table 8. This demonstrates that the classifications for Fabrics G and H would be the same under any of the three alternative dry cleaning procedures as they are under the Standard, making them all comparable alternatives.

The results for Fabric I illustrate that the mean and range of burn times for the three alternative dry cleaning procedures are similar to that of the Standard, but that all four methods have some variability clustered close to the burn time thresholds for different classifications. This makes burn codes relevant for purposes of determining classifications. Staff found that all 30 specimens of Fabric I tested using the Standard, silicone, and butylal had burn codes of SFBB poi, and that hydrocarbon yielded burn codes of SFBB (8 specimens), SFBB poi (17 specimens), and SFBB poi* (5 specimens). As such, Fabric I was Class 1 under the Standard, silicone, and butylal, but 8 of the specimens could potentially yield Class 2 or 3 results under the hydrocarbon option, depending on the burn time and the results of additional specimens. Although the hydrocarbon alternative could potentially result in different classifications than the Standard, these divergent results were limited to a small proportion of the hydrocarbon results, and most hydrocarbon results aligned with the classifications under the Standard.

The results for Fabric J also illustrate that the mean and range of burn times for the three alternative dry cleaning procedures are similar to that of the Standard. However, because the mean, minimum, and maximum are all well below the 7.0-second threshold for which

classification can be determined solely by burn times, burn codes are relevant for determining the classifications of these specimens.

Staff found that, under the dry cleaning procedure in the Standard, 27 of the specimens of Fabric J had a burn code of SFBB poi (making them Class 1) and 3 had a burn code of SFBB (potentially making them Class 2 or 3, depending on burn time and results of other specimens). The hydrocarbon alternative yielded 22 specimens with a burn code of SFBB poi (making them Class 1) and 8 with burn code of SFBB (potentially making them Class 2 or 3, depending on burn time and results of other specimens). In total, 11 specimens tested under the hydrocarbon alternative yielded different burn codes than the Standard and 19 specimens yielded the same burn codes under both methods. The silicone alternative yielded 24 specimens with a burn code of SFBB poi and 1 with a burn code of SFBB poi* (making them Class 1), along with 5 with burn code of SFBB (potentially making them Class 2 or 3, depending on burn time and results of other specimens). In total, 9 specimens tested under the silicone alternative yielded different burn codes than the Standard and 21 specimens yielded the same burn codes under both methods. The butylal alternative yielded 16 specimens with a burn code of SFBB poi (making them Class 1), and 14 with a burn code of SFBB (potentially making them Class 2 or 3, depending on burn time and results of other specimens). In total, 17 specimens tested under butylal alternative yielded different burn codes than the Standard and 13 specimens yielded the same burn codes under both methods.

This indicates that, for Fabric J, all three alternative dry cleaning options could result in different classifications than the Standard. However, it also indicates that, overall, a small proportion of the classifications under hydrocarbon and silicone have the potential to yield different classifications than the Standard, and most hydrocarbon and silicone results aligned with the classifications in the Standard. In addition, the number of hydrocarbon and silicone results that diverged from the Standard were similar, whereas divergent classifications were far more common for butylal.

The results for Fabric K illustrate that the mean and range of burn times for the three alternative dry cleaning procedures are similar to that of the Standard, but that all four methods have some variability clustered close to the burn time thresholds for different classifications. Staff found that all 30 specimens of Fabric K tested using the Standard, hydrocarbon, silicone, and butylal had burn codes of SFBB poi, making them all Class 1 under every option. This demonstrates that the classifications for Fabric K would be the same under any of the three alternative dry cleaning procedures as they are under the Standard, making them all comparable alternatives.

ii. Laundering

The comparison study results for the two alternative laundering specifications and the laundering specifications in the Standard are presented below. Table 9 provides the aggregated results for all plain surface textile fabrics. Table 10 provides the results for the individual plain surface textile fabrics and includes the number of samples tested that resulted in burn times,²⁹ mean burn times, standard deviations, minimum burn times, and maximum burn times.

Table 9. Burn times for plain surface textile fabrics, aggregated, by laundering procedure.

Procedure	Number of Samples with a Burn Time	Mean Burn Time	Standard Deviation	Minimum Burn Time	Maximum Burn Time
Standard	104	6.15 seconds	0.77	4.70 seconds	8.10 seconds
Reduced Agitation Speed	126	6.25 seconds	0.71	4.80 seconds	8.20 seconds
LP1-2021	86	6.12 seconds	0.92	4.60 seconds	9.50 seconds

Table 10. Burn times for plain surface textile fabrics (A through F), by laundering procedure.

Procedure	Number of Samples with a Burn Time	Mean Burn Time	Standard Deviation	Minimum Burn Time	Maximum Burn Time
Fabric A					
Standard	26	6.75 seconds	0.50	5.90 seconds	7.90 seconds
Reduced Agitation Speed	24	6.79 seconds	0.27	6.20 seconds	7.30 seconds
LP1-2021	18	7.12 seconds	0.27	6.80 seconds	7.70 seconds

²⁹ Although staff tested 30 specimens of each fabric/procedure combination, the number of samples with results in Table 10 is not 30 because only samples with burn times, rather than DNI results, are provided in the table. For DNI results, see Tab E of the briefing package supporting this NPR.

Fabric B					
Standard	16	6.49 seconds	0.26	6.00 seconds	7.00 seconds
Reduced Agitation Speed	28	6.43 seconds	0.32	5.60 seconds	7.10 seconds
LP1-2021	22	6.38 seconds	0.32	5.80 seconds	7.10 seconds
Fabric C					
Standard	28	5.24 seconds	0.38	4.70 seconds	6.10 seconds
Reduced Agitation Speed	30	5.30 seconds	0.34	4.80 seconds	6.20 seconds
LP1-2021	29	5.12 seconds	0.35	4.60 seconds	6.00 seconds
Fabric D					
Standard	24	6.03 seconds	0.41	5.20 seconds	7.50 seconds
Reduced Agitation Speed	26	6.16 seconds	0.41	5.60 seconds	7.10 seconds
LP1-2021	12	5.98 seconds	0.36	5.60 seconds	7.10 seconds
Fabric E					
Standard	4	7.03 seconds	0.72	6.60 seconds	8.10 seconds
Reduced Agitation Speed	6	7.53 seconds	0.42	7.20 seconds	8.20 seconds
LP1-2021	4	7.75 seconds	1.20	6.80 seconds	9.50 seconds
Fabric F					
Standard	6	6.92 seconds	0.69	6.30 seconds	8.10 seconds
Reduced Agitation Speed	12	6.94 seconds	0.52	6.20 seconds	7.90 seconds
LP1-2021	1	6.60 seconds	Not applicable	6.60 seconds	6.60 seconds

As Table 9 shows, for plain surface textile fabrics, both of the alternative laundering options yielded very similar burn times to the Standard, including the mean, minimum, and maximum burn times. Table 10 shows the same is true for each plain surface textile fabric tested, with very similar mean, minimum, and maximum burn times for each alternative and the laundering specification in the Standard. As Tables 9 and 10 show, for both the aggregated results and the individual fabric results, the Standard and both alternative laundering procedures yielded mean, minimum, and maximum burn times above the 3.5-second threshold for plain surface textile fabrics and, therefore, yielded the same classification—Class 1—for all of the fabrics. Moreover, the mean, minimum, and maximum burn times were all sufficiently above the 3.5-second threshold that, even with some variability in burn times, the alternatives would not alter the classifications of these fabrics, when compared to the classifications under the

Standard.³⁰ This demonstrates that, for plain surface textile fabrics, both alternative laundering procedures are comparable to the Standard.

Table 11 provides the aggregated results for all raised surface textile fabrics, and Table 12 provides the results for the individual raised surface textile fabrics.

Table 11. Burn times for raised surface textile fabrics, aggregated, by laundering procedure.

Procedure	Number of Samples with a Burn Time	Mean Burn Time	Standard Deviation	Minimum Burn Time	Maximum Burn Time
Standard	150	11.87 seconds	7.45	2.30 seconds	27.30 seconds
Reduced Agitation Speed	150	10.86 seconds	6.55	2.20 seconds	24.90 seconds
LP1-2021	150	10.76 seconds	6.72	2.00 seconds	31.50 seconds

Table 12. Burn times for raised surface textile fabrics (G through K), by laundering procedure.

Procedure	Number of Samples with a Burn Time	Mean Burn Time	Standard Deviation	Minimum Burn Time	Maximum Burn Time
Fabric G					
Standard	30	19.66 seconds	2.25	16.60 seconds	27.30 seconds
Reduced Agitation Speed	30	17.93 seconds	2.30	10.10 seconds	22.50 seconds
LP1-2021	30	16.80 seconds	2.13	13.80 seconds	22.90 seconds
Fabric H					
Standard	30	21.16 seconds	2.62	16.00 seconds	26.00 seconds
Reduced Agitation Speed	30	18.54 seconds	2.90	10.90 seconds	24.90 seconds
LP1-2021	30	19.55 seconds	3.82	11.40 seconds	31.50 seconds
Fabric I					
Standard	30	7.18 seconds	1.45	5.0 seconds	12.70 seconds
Reduced Agitation Speed	30	6.38 seconds	1.00	4.80 seconds	8.70 seconds
LP1-2021	30	6.31 seconds	1.03	4.30 seconds	9.10 seconds
Fabric J					
Standard	30	2.84 seconds	0.28	2.30 seconds	3.40 seconds
Reduced Agitation Speed	30	2.89 seconds	0.34	2.20 seconds	3.50 seconds
LP1-2021	30	2.74 seconds	0.37	2.00 seconds	3.80 seconds
Fabric K					
Standard	30	8.51 seconds	0.77	7.10 seconds	10.50 seconds

³⁰ Like the dry cleaning results, staff also considered the extent to which both of the alternative laundering options yielded DNI results versus burn times, as compared to the Standard. Again, because all of the plain surface textile fabrics in the comparison study of laundering options yielded either DNI results or burn times of more than 3.5 seconds, they were all Class 1. Consequently, the results of DNI versus burn times for these fabrics are not presented here, since they do not alter the classifications. Moreover, it is expected that there will be variation in whether multiple specimens yield DNI or burn time results even when they are specimens of the same fabric that underwent the same refurbishing procedure. For details on these results, see Tab E of the briefing package supporting this NPR.

Reduced Agitation Speed	30	8.58 seconds	0.81	7.40 seconds	11.20 seconds
LP1-2021	30	8.38 seconds	1.10	7.20 seconds	12.90 seconds

As Table 11 shows, for raised surface textile fabrics, the alternative laundering options yielded very similar burn times to the Standard, including the mean, minimum, and maximum burn times. Table 12 shows that, for each raised surface textile fabric tested, there were also similar mean, minimum, and maximum burn times for each alternative and the laundering specification in the Standard. Tables 11 and 12 also illustrate the wide variability in burn times for raised surface textile fabrics, even when testing the same fabric with the same laundering procedure. As explained above, this variation is expected, particularly for raised surface textile fabrics, both within results for a single fabric and across different fabric types.

As the results in Table 11 show, both of the alternative laundering procedures yielded the same Class 1 results as the Standard since they all had mean burn times above 7.0 seconds. These mean results were also sufficiently above the 7.0 second threshold that, even with some variability in burn times, the alternatives would not alter the classifications when compared to the classifications under the Standard. The wide range of minimum and maximum burn times in Table 11 is the result of variations in different raised surface textile fabrics, which behaved similarly for the laundering alternatives and the dry cleaning alternatives. The results of individual fabrics are discussed below.

The results for Fabric G, in Table 12, show that the mean, minimum, and maximum burn times for this fabric were all well above the 7.0-second threshold and, therefore, Class 1 using either of the alternatives or the Standard. Even with some variability in burn times, the burn times were sufficiently above the 7.0-second threshold that this would not alter the classifications. In addition, all of the specimens tested under both alternatives and the Standard yielded burn codes of SFBB poi. The same is true of the burn time and burn code results for Fabric H, in Table 12. This demonstrates that the classifications for Fabrics G and H would be

the same under either of the alternative laundering procedures as they are under the Standard, making them both comparable alternatives.

The results for Fabric I illustrate that the mean and range of burn times for the two alternative laundering procedures are similar to that of the Standard, but that all three methods have some variability clustered close to the burn time thresholds for different classifications. This makes burn codes relevant for purposes of determining classifications. Staff found that all 30 specimens of Fabric I tested using the Standard and both laundering alternatives had burn codes of SFBB poi, making all of them Class 1, regardless of burn time. This demonstrates that the classification for Fabric I would be the same under either of the alternative laundering procedures as they are under the Standard, making them both comparable alternatives.

The results for Fabric J also illustrate that the mean and range of burn times for the two alternative laundering procedures are very similar to that of the Standard. Because the mean, minimum, and maximum are all well below the 7.0-second threshold for which classification can be determined solely by burn times, burn codes are relevant for determining the classifications of these specimens. Staff found that, under the laundering procedure in the Standard, 27 specimens of Fabric J had a burn code of SFBB poi (making them Class 1) and 3 had a burn code of SFBB (potentially making them Class 3 depending on the results of other specimens because all burn times were less than 4.0 seconds). The reduced agitation speed alternative yielded 24 specimens with a burn code of SFBB poi (making them Class 1) and 6 with a burn code of SFBB (potentially making them Class 3 depending on the results of other specimens because all burn times were less than 4.0 seconds). In total, 5 specimens tested under the reduced agitation speed alternative yielded different burn codes than the Standard. The LP1-2021 alternative yielded 27 specimens with a burn code of SFBB poi (making them Class 1) and 3 with a burn code of SFBB (potentially making them Class 3 depending on the results of other specimens because all burn times were less than 4.0 seconds). In total, 6 specimens tested under LP1-2021 yielded different burn codes than the Standard.

This indicates that although both alternative laundering options could result in different classifications than the Standard, only a very small proportion of the results indicate this, and most results align with the classifications in the Standard. In addition, the number of reduced agitation speed and LP1-2021 burn code results that diverged from the Standard were nearly identical, indicating they provide similar equivalency to the Standard. Also, there were fewer classifications that differed when comparing LP1-2021 results and those under the Standard than when comparing the reduced agitation speed option to the Standard.

The results for Fabric K show that the mean, minimum, and maximum burn times for this fabric were all above the 7.0-second threshold and, therefore, Class 1 using either of the laundering alternatives or the Standard. However, because some of the burn times were close to this threshold, staff also considered their burn behavior. Staff found that all 30 specimens of Fabric K tested using the Standard, the reduced agitation speed alternative, and the LP1-2021 alternative had burn codes of SFBB poi. As such, even if burn times had been below the 7.0-second threshold, they would all still be Class 1 under every option. This demonstrates that the classifications for Fabric K would be the same under either of the alternative laundering procedures as they are under the Standard, making them all comparable alternatives.

3. Proposed Amendments and Rationale

a. Dry Cleaning

Based on staff's assessment and testing, the Commission proposes to amend the dry cleaning solvent requirements in the Standard to include, as an alternative to commercial grade perchloroethylene, commercial grade hydrocarbon solvent. Specifically, the Commission proposes to specify that the following conditions are permissible:

- hydrocarbon solvent,
- cationic detergent class,
- 20-25 minutes cleaning time,
- 4 minutes extraction time,

- 60-66°C (140-150°F) drying temperature,
- 20-25 minutes drying time, and
- 5 minutes cool down/deodorization time.

The Commission is not proposing to remove the perchloroethylene option from the Standard because this procedure is still available and widely used. However, because of the increasing restrictions on the use of perchloroethylene, the Commission proposes to also allow hydrocarbon as an alternative dry cleaning method. This would allow testing laboratories to continue to use perchloroethylene where it is available and permissible but accommodate testing laboratories that can no longer access or use this method.

As the comparison testing indicates, all three alternative dry cleaning procedures that staff tested would provide comparable and acceptable alternatives to the dry cleaning procedures in the Standard. Overall, fabrics yielded the same classifications under the hydrocarbon alternative as they did under the Standard. Although a small portion of the raised surface textile fabrics showed the potential to result in different classifications using hydrocarbon solvent, compared to the Standard, this was true for all three alternatives considered, and less so for hydrocarbon and silicone than for butylal; this only applied to a small portion of the fabrics and hydrocarbon results; variability in results was evident even in the results under the current Standard; and variability in flammability results is expected across specimens of the same fabric using the same procedure, particularly for raised surface fabrics. As such, in general, hydrocarbon solvent yields comparable flammability results to the Standard and is among the best options available to provide the needed alternative to perchloroethylene for testing laboratories that can no longer use that solvent. In addition, the Commission proposes to allow the use of hydrocarbon solvent, rather than silicone or butylal, because it is the most commonly used alternative to perchloroethylene, has a long history of use, and is less expensive than other alternatives. Also, several companies manufacture hydrocarbon solvents for dry cleaning,

whereas silicone and butylal are newer technologies and patented, making their availability more limited.

However, CPSC also considered several variations on this proposal, including whether perchloroethylene should remain an option, and whether some other alternative or combination of alternatives including hydrocarbon, silicone, and butylal, should be permissible. The Commission requests comments on the proposed revision, including the solvent and associated parameters, the comparison testing, and the justifications for the proposed requirement. The Commission also requests comments on the alternatives considered and the justifications for them.

b. Laundering

Proposed amendments. Based on staff's assessment and testing, the Commission proposes to amend the laundering specifications in the Standard to remove the incorporation by reference of TM 124-2006 and, instead, incorporate by reference LP1-2021. Specifically, the Commission proposes to require that:

- washing conform to the provisions in section 9.2 and 9.4, and the provisions for “(1) Normal” and “(IV) Hot” in Table 1, *Standard Washing Machine Parameters*, of LP1-2021; and
- drying conform to the provisions in section 12.2(A), and the provisions for “(Aiii) Permanent Press” in Table VI, *Standard Tumble Dryer Parameters*, of LP1-2021.

These specifications are those staff used during comparison testing and are shown in Table 3, above.

In addition, for purposes of 16 CFR 1610.40, the Commission preliminarily concludes that the testing CPSC staff conducted that is provided in this notice and in full detail in Tabs D

and E of the briefing package supporting this proposed rule³¹ constitutes information demonstrating that the washing procedure specified in the current Standard—that is:

- in compliance with sections 8.2.2, 8.2.3 and 8.3.1(A) of TM 124-2006,
- using AATCC 1993 Standard Reference Detergent, powder,
- with wash water temperature (IV) ($120^{\circ} \pm 5^{\circ}\text{F}$; $49^{\circ} \pm 3^{\circ}\text{C}$) specified in Table II of TM 124-2006,
- using water level, agitation speed, washing time, spin speed and final spin cycle for “Normal/Cotton Sturdy” in Table III of TM 124-2006, and
- with a maximum wash load of 8 pounds (3.63 kg) and consisting of any combination of test samples and dummy pieces—

is as stringent as the washing procedure in LP1-2021 that is proposed to be required in this NPR. If firms rely on this information and conform to the other requirements in section 1610.40, this will provide an option for them to continue to use washing machines that comply with the provisions in TM 124-2006 in the current Standard.

Likewise, for purposes of 16 CFR 1610.40, the Commission preliminarily concludes that the testing CPSC staff conducted that is provided in this notice and in full detail in Tabs D and E of the briefing package supporting this proposed rule³² constitutes information demonstrating that the drying procedure specified in the current Standard—that is:

- in compliance with section 8.3.1(A), Tumble Dry, of TM 124-2006,
- using the exhaust temperature ($150^{\circ} \pm 10^{\circ}\text{F}$; $66^{\circ} \pm 5^{\circ}\text{C}$) specified in Table IV, “Durable Press,” of TM 124-2006, and
- with a cool down time of 10 minutes specified Table IV, “Durable Press,” of TM 124-2006—

³¹ Available at: https://www.cpsc.gov/s3fs-public/Proposed-Rule-to-Amend-the-Standard-for-the-Flammability-of-Clothing-Textiles-16-CFR-part-1610.pdf?VersionId=4QrYt7W05qY5gEiFf_ohdwT4j8.FGDoR.

³² Available at: https://www.cpsc.gov/s3fs-public/Proposed-Rule-to-Amend-the-Standard-for-the-Flammability-of-Clothing-Textiles-16-CFR-part-1610.pdf?VersionId=4QrYt7W05qY5gEiFf_ohdwT4j8.FGDoR.

is as stringent as the drying procedure in LP1-2021 that is proposed to be required in this NPR. If firms rely on this information and conform to the other requirements in section 1610.40, this will provide an option for them to continue to use dryers that comply with the provisions in TM 124-2006 in the current Standard.

Allowance in 16 CFR 1610.40. Although the Commission is proposing to require the use of laundering machines that comply with specified provisions in LP1-2021, testing laboratories could continue to use machines that comply with the provisions of TM 124-2006 referenced in the current Standard, in accordance with 16 CFR 1610.40.

As discussed above, section 1610.40 allows the use of alternative apparatus, procedures, or criteria for tests for guaranty purposes when reasonable and representative tests that use apparatus or procedures other than those in the Standard confirm compliance with the Standard, under specified conditions. This allowance specifies that an alternative must be as stringent as, or more stringent than the Standard, and that the Commission considers an alternative to meet this requirement “if, when testing identical specimens, the alternative test yields failing results as often as, or more often than, the test” in the Standard. Anyone using an alternative under this allowance must have data or information demonstrating this required stringency and retain it while the alternative is used to support a guaranty and for one year after. See 16 CFR part 1610 for full details regarding this allowance.

If the Commission finalizes this proposed rule and requires the use of laundering specifications in LP1-2021, then testing laboratories that want to continue to use laundering specifications that meet the specifications of TM 124-2006 that are referenced in the current Standard could use the results of staff’s comparison testing to demonstrate that the laundering specification in TM 124-2006 that is referenced in the current Standard is as stringent as or more stringent than the specifications in LP1-2021 referenced in the proposed amendment. The following summarizes how staff’s comparison testing demonstrates that the laundering

specification in TM 124-2006 yields failing results as often as, or more often than the laundering specification in LP 1-2021, when testing identical specimens.

As discussed above, the aggregated results for both plain and raised surface textile fabrics (Tables 9 and 11) show that the mean burn times and classifications are comparable when specimens are laundered in accordance with the relevant specifications in TM 124-2006 or LP1-2021. More specifically, all of the individual plain surface textile fabrics yielded the same classifications—Class 1—whether tested in accordance with the relevant laundering procedures in TM 124-2006 or LP1-2021 and had sufficiently high burn times to consistently yield the same classifications, even if there was slight variability in burn times (Table 10). This demonstrates that, for plain surface textile fabrics, the relevant specifications in TM 124-2006 are as stringent as LP1-2021 since they yield failing results as often as LP1-2021.

Similarly, of the raised surface textile fabrics, Fabrics G, H, I, and K yielded the same classifications—Class 1—whether tested in accordance with the relevant laundering specifications in TM 124-2006 or LP1-2021 and had sufficiently high burn times and identical burn codes to consistently yield the same classifications, even if there was slight variability in burn times (Table 12). Only Fabric J had some deviations in burn codes, but even with these deviations, the classifications were the same. Specifically, although 6 of the 30 specimens of Fabric J tested under the laundering specification in LP1-2021 yielded different burn codes than those specimens tested under TM 124-2006, both laundering procedures still resulted in 27 of the 30 specimens tested under them having burn codes and burn times that would yield Class 1 results and three specimens with burn codes and burn times that could yield Class 3 results depending on the results of other specimens. Because flammability results are based on the final classification, and not just burn codes, this demonstrates that, for raised surface textile fabrics, the relevant laundering specifications in TM 124-2006 are as stringent as those in LP1-2021 since they yield failing results as often as LP1-2021.

Based on this information, the Commission preliminarily concludes that this NPR and the information provided in Tabs D and E of the briefing package supporting this proposed rule³³ satisfy the documentation requirements in section 1610.40 by demonstrating the necessary equivalency of the laundering specifications in TM 124-2006 that are referenced in the current Standard and those in LP1-2021 that the Commission proposes to adopt. If firms rely on this information and conform to the other requirements in section 1610.40, this will provide an option for them to continue to use laundering machines that comply with TM 124-2006 after the effective date of a final rule amending these provisions. This would minimize the impact of the proposed amendments on testing laboratories.

Comparison. As explained above, the laundering parameters in LP1-2021 differ somewhat from those in the Standard. Table 13 shows a comparison of the parameters. Although agitation speed is the only parameter of the Standard that machines can no longer meet, the Commission is proposing to require additional parameters from LP1-2021 as well, all of which were used during comparison testing. As explained above, certain parameters must be adjusted to accommodate other parameter changes, as certain parameters work in concert (*e.g.*, agitation speed and stroke length). In addition, certain parameters must be adjusted to reflect parameters for which LP1-2021 washing machines are designed (*e.g.*, load size). Finally, using all relevant parameters from a single standard provides for better clarity and ease of use.

Table 13. Comparison of laundering procedure parameters.

	Standard	LP1-2021
Washing Machine Parameters		
AATCC 1993 Standard Reference Detergent	66 ± 0.1 g (2.3 ± 0.004 oz)	66 ± 1 g (2.3 ± 0.004 oz)
Water Level	68 ± 4 L (18 ± 1 gal)	72 ± 4 L (19 ± 1 gal)
Agitation Speed	179 ± 2 spm	86 ± 2 spm
Stroke Length	Not specified	Up to 220°
Washing Time	12 min	16 ± 1 min
Spin Speed	645 ± 15 rpm	660 ± 15 rpm
Final Spin Time	6 min	5 ± 1 min
Wash Temperature	49 ± 3°C (120 ± 5°F)	49 ± 3°C (120 ± 5°F)
Load size	Maximum 8 lbs (3.63 kg)	4 ± 0.2 lbs (1.8 ± 0.1 kg)

³³ Available at: https://www.cpsc.gov/s3fs-public/Proposed-Rule-to-Amend-the-Standard-for-the-Flammability-of-Clothing-Textiles-16-CFR-part-1610.pdf?VersionId=4QrYt7W05qY5gEiFf_ohdwT4j8.FGDoR.

		Note that the proposed rule sets this as a maximum.
Dryer Parameters		
Maximum Dryer Exhaust Temperature	66 ± 5°C (150 ± 10°F)	68 ± 6 °C (155 ± 10°F)
Cool Down Time	10 min	≤10 min

Rationale. The Commission proposes to incorporate by reference the laundering specifications in LP1-2021, instead of requiring the reduced agitation speed alternative (*i.e.*, maintaining the requirement to meet specifications in TM 124-2006, but with a reduced agitation speed), for several reasons. For one, LP1-2021 is a standard that is commonly used by testing laboratories to launder samples for other tests. As such, testing laboratories are likely to already have this standard, be familiar with it, and have machines that comply with it. Also, there are more washing machines on the market that meet the specifications in LP1-2021 than the reduced agitation speed parameters staff examined. It is likely that only programmable washing machines where the agitation speed can be set by the user would be able to meet the reduced agitation speed parameters, whereas, both programmable machines and those with set parameters built to meet LP1-2021 specifications would be able to meet the proposed requirement.

Finally, as the comparison study results show, both the reduced agitation speed and LP1-2021 alternatives yield nearly identical classifications as the Standard, with only one raised surface textile fabric—Fabric J—having slightly different results when comparing the Standard and the alternatives. However, even for that fabric, the Standard and LP1-2021 yielded the same number of Class 1 results (27 specimens), while the reduced agitation speed alternative yielded 26 Class 1 results. As such, overall, fabrics yielded the same classifications under the LP1-2021 alternative as they did under the Standard and LP1-2021 is among the best options available to provide the needed alternative to TM 124-2006 since testing laboratories can no longer obtain washing machines that comply with that standard.

In addition to updating the washing machine specifications stated in section 1610.6(b)(1)(ii), the Commission proposes to update the drying specifications in that section to also incorporate by reference LP1-2021, for consistency and simplicity. Although clothes dryers

have not changed significantly in recent years and machines that comply with TM 124-2006 are still available on the market, the Commission proposes to update this requirement for several reasons. For one, it is preferable for testing to follow the procedures and specifications in one standard for the entire laundering process, rather than using components of different standards for washing and drying, to ensure consistent and compatible testing. In addition, using two separate standards for washing and drying could lead to confusion or errors in testing, which could affect flammability results. Also, obtaining and maintaining two separate standards potentially would be cumbersome and slightly more costly for testing laboratories. Because many testing laboratories likely already have and are familiar with LP1-2021 to test for compliance with other standards, requiring the use of only this standard would be simpler, clearer, and less costly.

Finally, the dryer specifications in TM 124-2006 and LP1-2021 are nearly identical, which means the proposed update is unlikely to require testing laboratories to replace dryers that comply with the current Standard. As explained above, the Standard currently requires that drying be performed in accordance with section 8.3.1(A) of TM 124-2006 using the exhaust temperature and cool down time specified in “Durable Press” of Table IV of that standard. The Commission proposes to require that drying be performed in accordance with section 12.2(A) of LP1-2021 using the exhaust temperature and cool down time specified in “(Aiii) Permanent Press” of Table VI of that standard. These requirements are nearly identical—the comparison is discussed below.

Section 8.3.1(A) of TM 124-2006 and section 12.2(A) of LP1-2021 include essentially identical requirements that simply require tumble drying and immediate removal of samples. Similarly, reference to “Permanent Press” instead of “Durable Press” does not alter any requirements because the two terms have the same meaning—permanent press is simply the term more commonly used by industry currently.

As for exhaust temperature, in TM 124-2006, “Durable Press” of Table IV specifies that the dryer exhaust temperature is $66 \pm 5^{\circ}\text{C}$, whereas, in LP1-2021, (Aiii) “Permanent Press” of Table VI specifies that the maximum dryer exhaust temperature is $68 \pm 6^{\circ}\text{C}$. As such, the range of exhaust temperatures is nearly identical in both standards, with TM 124-2006 allowing a range of $61\text{--}71^{\circ}\text{C}$ and LP1-2021 allowing a range of $62\text{--}74^{\circ}\text{C}$. Thus, by updating the Standard to require the use of LP1-2021, only dryers with an exhaust temperature of precisely 61°C would no longer be permissible, and dryers with exhaust temperatures of $72\text{--}74^{\circ}\text{C}$ would become permissible. Because most dryers are designed to target the mid-range of permissible temperatures, staff does not expect many dryers to fall outside the range that is permissible under both standards. To the extent that a dryer complies with the current Standard, but not the exhaust temperature range in LP1-2021, Table VI, (Aiii) Permanent Press, testing laboratories would have section 1610.40 as an option to continue using their existing dryers.

Similarly, with respect to cool down time, TM 124-2006, “Durable Press” of Table IV specifies that the cool down time is 10 minutes, whereas in LP1-2021, (Aiii) “Permanent Press” of Table VI specifies that the cool down time is 10 minutes or less. As such, by updating the Standard to require the use of LP1-2021, there is a wider allowance for cool down time, including that specified in TM 124-2006.

Based on the very minor differences between the dryer specifications in TM 124-2006 and LP1-2021, staff expects that this proposed update would not require testing laboratories to replace any dryers because all machines that comply with TM 124-2006 are likely to also comply with LP1-2021, and the allowance in 16 CFR 1610.40 is available for the small number of machines that may become non-compliant.

Alternatives. The Commission considered several variations on this proposal. One alternative the Commission considered is to update the incorporation by reference in the Standard from TM 124-2006 to the most recent version of that standard, TM 124-2018. AATCC has updated TM 124 several times since 2006 (in 2009, 2010, 2011, 2014, and 2018) to reflect

the evolving specifications of machines available on the market. In the 2010 and 2011 versions of the standard, AATCC removed the table specifying the washing machine parameters that is referenced in the Commission's regulations, instead referencing AATCC Monograph 6 "Standardization of Home Laundry Test Conditions." AATCC later replaced the reference to Monograph 6 with reference to LP1, and then later revised TM 124 again to include a table specifying washing machine parameters.

The washing and drying specifications in TM 124-2018 are the same as those the Commission proposes to incorporate by reference from LP1-2021, but the Commission is not proposing to incorporate by reference TM 124-2018 for several reasons. For one, unlike LP1-2021 and the relevant provisions in the Standard, TM 124 is not just a laundering procedure—it is primarily intended to evaluate the smoothness appearance of fabrics after laundering and, accordingly, has procedures addressing that purpose. In contrast, the Standard is intended only for flammability assessments, and LP1-2021 is intended to be a stand-alone laundering protocol that can be used for flammability testing. In addition, because AATCC has referenced laundering specifications in several different ways over multiple revisions to TM 124, referencing TM 124 is a less reliable way of incorporating by reference these laundering requirements. In contrast, LP1-2021 is not expected to significantly change the laundering procedures the Commission proposes to incorporate by reference.

Another alternative the Commission considered is allowing both the continued use of the laundering specifications in the Standard (*i.e.*, TM 124-2006) and, as an alternative, the specifications in LP1-2021. The Commission is not proposing that option for several reasons. For one, when CPSC's washing machines that meet TM 124-2006 reach the end of their useful lives, CPSC will be unable to replace them with machines that meet that specification. At that point, CPSC will be unable to assess compliance with the Standard under TM 124-2006. Moreover, retaining a specification in the regulations that can no longer be met by machines available on the market leaves the regulations outdated. Instead, the Commission highlights 16

CFR 1610.40, which already provides an allowance for firms to use alternative apparatus for testing, under specific conditions. The Commission is facilitating the use of this allowance by providing in this notice and supporting materials the information supporting the use of 16 CFR 1610.40. Alternatively, the Commission could require firms to supply their own supporting information for section 1610.40.

Similarly, the Commission considered amending the Standard to include the specifications in LP1-2021, while allowing for the continued use of TM 124-2006 for a limited phase-out period. The Commission is not proposing this option because it would create the same problems as allowing continued use of TM 124-2006 indefinitely, and staff does not have information about an appropriate phase-out period for machines that comply with TM 124-2006. Although these machines have not been available on the market for many years, some testing laboratories have maintained existing machines, and it is difficult to determine when all such machines will be out of use.

In addition, the Commission considered only updating the washing machine specifications in the Standard, and not the dryer specifications, since only the washing machine specifications can no longer be met by machines available on the market. However, the Commission is proposing to also update the dryer specifications for the reasons discussed above.

Comments. The Commission requests comments on the proposed amendments, including the laundering specifications, comparison testing, use of the allowance in 16 CFR 1610.40, and the justifications for the proposed requirements. The Commission also requests comments on the alternatives considered and the justifications for them, including the reduced agitation speed, LP1-2021, TM 124-2018, allowing both TM 124-2006 and LP1-2021, providing a phase-out period for TM 124-2006, and the dryer specification. In addition, the Commission seeks information or data regarding the options the Commission has considered, such as how many testing laboratories use washing machines that comply with TM 124-2006, how many such machines testing laboratories use, the expected useful life remaining on these machines, and the

extent to which testing laboratories' dryers comply with TM 124-2006 but would not comply with LP1-2021.

IV. Relevant Existing Standards

CPSC staff reviewed and assessed several voluntary and international standards that are relevant to clothing flammability:

- TM 124;
- LP1-2021;
- ASTM D1230-22, *Standard Test Method for Flammability of Apparel Textiles*; and
- Canadian General Standards Board Standard CAN/CGSB-4.2 No. 27.5, *Textile Test Method Flame Resistance - 45° Angle Test – One-Second Flame Impingement*.

As explained above, TM 124-2006 is currently incorporated by reference into the Standard as part of the laundering requirements, but washing machines that meet this specification are no longer available on the market. The current version, TM 124-2018, includes washing and drying specifications that are the same as LP1-2021. However, TM 124 is not a flammability standard; rather, it is intended to evaluate the smoothness appearance of fabrics after repeated home laundering. As such, it contains provisions that are not relevant to flammability testing and lacks provisions that are necessary for flammability testing.

Similarly, the Commission is proposing to incorporate by reference portions of LP1-2021, but this standard also does not include full flammability testing and classification requirements because it is intended as a stand-alone laundering protocol, for use with other test methods. ASTM D1230 is similar to the Standard but contains similar issues to those this proposed rule aims to address (*e.g.*, same stop thread description as the Standard), and it contains different laundering specifications, terminology, and burn codes. The Canadian standard also is similar to the Standard, but also has some differences (*e.g.*, allows a single Tex size for stop thread).

V. Preliminary Regulatory Analysis

The Commission is proposing to amend a rule under the FFA, which requires that an NPR include a preliminary regulatory analysis. 15 U.S.C. 1193(i). The following discussion is extracted from staff's preliminary regulatory analysis, available in Tab F of the NPR briefing package.

A. Preliminary Description of Potential Costs and Benefits of the Proposed Rule

The preliminary regulatory analysis must include a description of the potential benefits and costs of the proposed rule, including unquantifiable benefits and costs.

1. Potential Benefits

The primary benefit of the proposed amendments is a reduction of burdens for testing laboratories by clarifying existing requirements and updating the specifications for stop thread, dry cleaning, and laundering to include options that are identifiable, permissible for use, and currently available on the market. In addition, the proposed amendments should improve consumer safety. The proposed amendments provide comparable flammability results to the current Standard but would improve testing laboratories' abilities to conduct testing and obtain consistent and reliable results. This should improve consumer safety by ensuring that textiles intended for use in clothing are properly tested and classified so that dangerously flammable textiles are not used in clothing. Staff is unable to quantify these potential benefits because of the difficulty of measuring the extent of testing laboratories' burden reduction and possible improvements to consumer safety. However, staff estimates that these benefits are likely to be small.

Burn Codes. The proposed amendments to burn codes would clarify and streamline these provisions, which staff expects would improve the consistency and reliability of flammability testing results and classifications. This, in turn, may provide some safety benefit to consumers, and reduce testing burdens for testing laboratories. Because these proposed amendments are intended to clarify existing provisions and would not change current requirements for testing or classification, staff expects that they would provide a small amount of unquantifiable benefits.

Stop Thread. The proposed amendments to the stop thread specification would clarify the type of thread required by using the Tex system, which is commonly used and understood by the industry, to define the thread size. The proposed amendments would also expand the range of threads permissible for use under the Standard by providing a range of permissible Tex sizes, rather than specifying a single thread specification, as the current Standard does. As such, the proposed amendments would clarify the requirements, which may have consumer safety benefits by yielding more consistent and reliable test results. However, these benefits are expected to be small since the proposed amendments would provide comparable test results and classifications to the current Standard. The proposed amendments also may ease burdens on testing laboratories, by making it easier to identify compliant thread and by making more threads permissible for use. Therefore, staff expects that these proposed amendments would provide a small amount of unquantifiable benefits.

Dry Cleaning Specification. The proposed amendments to the dry cleaning specification would allow for the continued use of the existing specification using perchloroethylene solvent, and also add an additional specification, as an alternative, to accommodate testing laboratories that will soon be unable to use the solvent currently specified in the Standard. The alternative specification, using hydrocarbon solvent, provides comparable flammability results to the current solvent specified in the Standard and staff notes that the cost of hydrocarbon solvent is comparable (or lower) in cost than other alternatives. Therefore, staff expects the proposed amendments to reduce burdens on testing laboratories by providing an additional alternative dry cleaning specification and allowing testing laboratories that are subject to restrictions on the use of perchloroethylene to continue to test to the Standard.

Laundry Specification. The proposed amendments to the washing specifications would provide a specification that can be met by machines that are currently on the market. Staff expects that this will reduce burdens on testing laboratories because it would allow testing laboratories that can no longer maintain or obtain washing machines that comply with the

Standard to continue to test to the Standard, and it would eliminate their need to maintain and repair older outdated machines. Staff expects the proposed amendments to the drying specifications would provide benefits as well. By requiring the use of the same standard for both washing and drying, these amendments would streamline the requirements for testing laboratories, making it less cumbersome and less costly than obtaining and following two standards. Moreover, LP1-2021 is already familiar to many testing laboratories since it is used for other standards as well; as such, using this standard should be clear and low cost. In addition, by requiring the use of a widely familiar standard for both washing and drying, the proposed amendments should provide for consistent and reliable test results and classifications, and requiring the use of a single standard should reduce the risk of confusion or testing errors from referencing two standards, both of which may have some safety benefits for consumers.

2. Potential Costs

Burn Codes. The proposed amendments regarding burn codes only clarify and streamline existing requirements, and would not change any testing, flammability results, or classification criteria. As such, staff does not expect these proposed amendments to have any notable costs.

Stop Thread. The proposed amendments regarding the stop thread specification clarify and expand the range of permissible threads. They would not change any testing, flammability results, or classification criteria. As staff's testing indicates, thread that meets the current specification in the Standard would comply with the proposed amendments, and the proposed amendments would allow for the use of a wider range of threads than the current Standard. This would allow testing laboratories to continue to use their existing thread or more easily obtain compliant thread by providing a wider range of options. Therefore, staff does not expect these proposed amendments to have any notable costs.

Dry Cleaning Specification. The proposed amendments regarding the dry cleaning specification allow for the continued use of the existing specification (using perchloroethylene solvent), but also provides an additional alternative specification (using hydrocarbon solvent).

The proposed amendments would not change any testing requirements or criteria and, as staff's testing demonstrates, the hydrocarbon alternative provides comparable flammability results and classifications to the perchloroethylene specification. As such, testing laboratories could continue to use the existing specification, but would also have an additional option for complying with the Standard. Therefore, staff does not expect these proposed amendments to have any notable costs.

Laundering Specification. The proposed amendments regarding the washing specification would require different washing machines than those that currently comply with the Standard, since those machines are no longer available on the market. However, firms have the option to continue using machines that comply with the current Standard under 16 CFR 1610.40, thereby avoiding the need to obtain new washing machines. In this notice, the Commission preliminary concludes that, for purposes of 16 CFR 1610.40, the testing CPSC staff conducted that is provided in this notice and in full detail in Tabs D and E of the briefing package supporting this proposed rule constitutes information demonstrating that the washing procedure specified in the current Standard is as stringent as the washing procedure in LP1-2021 that is proposed to be required in this NPR. Therefore, if firms rely on this information and conform to the other requirements in section 1610.40, this will provide an option for them to continue to use washing machines that comply with the provisions in TM 124-2006 in the current Standard. This alternative would impose no costs, as testing laboratories could continue to use their existing compliant machines.

Although staff does not expect the proposed amendments to the washing specifications to impose any costs, staff examined potential costs associated with obtaining machines that comply with the proposed amendments to assess the costs to firms that choose to do so, rather than continue to use existing machines in accordance with the allowance in 16 CFR 1610.40. One potential cost to firms that choose to obtain new machines would be the cost of buying a copy of LP1-2021, which is approximately \$50 for AATCC members and \$70 for non-members. Staff

does not consider this a significant cost and firms will not incur this cost if they already have LP1-2021 to comply with other standards.

The primary cost to firms that choose to obtain new machines would be the cost of new washing machines that comply with LP1-2021. Staff estimates that these machines cost an average of \$4,300 (excluding tax but including certified calibration, packaging, and shipping). However, this cost would be offset by the reduced costs of no longer needing to repair or maintain existing, outdated machines. Staff estimates that the cost of maintaining and repairing the outdated machines is \$300 annually and assumes that if a laboratory chooses to upgrade machines, it expects to receive benefits from the upgrade that outweigh the acquisition costs.

Staff was unable to determine the number of testing laboratories that test to the Standard and that would, therefore, be subject to the proposed amendments. At a minimum, staff notes that there currently are more than 300 testing laboratories that are CPSC-accepted third party laboratories that test to the Standard for purposes of children's product certifications. However, that is an underestimate of the number of firms impacted by the proposed rule because testing laboratories need not be CPSC-accepted third party laboratories to test to the Standard for non-children's products. At a maximum, staff notes that there are a total of 7,389 testing laboratories in the United States, according to the Census Bureau. However, this is an overestimate of the number of firms in the United States impacted by the proposed rule because this number includes testing laboratories that do not test to the Standard. Staff estimates that each testing laboratory that tests to the Standard has three washing machines that do not meet LP1-2021.

The proposed amendments regarding the drying specification are unlikely to require different dryers than those that currently comply with the Standard, since most dryers can comply with both specifications. However, to the extent that dryers that meet the current Standard would not meet the proposed amendments, firms would again have the option to continue to use their existing compliant dryers in accordance with 16 CFR 1610.40. Therefore, this alternative would eliminate any potential costs associated with the proposed amendments.

Moreover, because most dryers comply with both the current Standard and LP1-2021, staff does not expect that most firms would need to replace their dryers even if they chose to comply with LP1-2021, instead of using 16 CFR 1610.40 to continue to comply with TM 124-2006.

B. Reasons for Not Relying on a Voluntary Standard

When the Commission issues an ANPR under the FFA, it must invite interested parties to submit existing standards or provide a statement of intention to modify or develop a standard that would address the hazard at issue. 15 U.S.C. 1193(g). When CPSC receives such standards or statements in response to an ANPR, the preliminary regulatory analysis must provide reasons that the proposed rule does not include such standards. *Id.* 1193(i). In the present rulemaking, the Commission did not issue an ANPR. Accordingly, CPSC did not receive submissions of standards or statements of intention to develop standards regarding clothing flammability.

C. Alternatives to the Proposed Rule

A preliminary regulatory analysis must describe reasonable alternatives to the proposed rule, their potential costs and benefits, and a brief explanation of the reasons the alternatives were not chosen. 15 U.S.C. 1193(i). CPSC considered several alternatives to the proposed rule. These alternatives, their potential costs and benefits, and the reasons the Commission did not select them, are described in detail in section **VI. Alternatives to the Proposed Rule**, below, and Tab F of the NPR briefing package.

VI. Alternatives to the Proposed Rule

Burn Codes. CPSC could retain the current burn code provisions in the Standard, rather than updating them. This alternative would not create any costs, but also would not provide any benefits. In comparison, the proposed amendments also would not create any costs, but would have benefits. Based on staff's assessment of needed clarifications, and comments on the RFI indicating the need for these clarifications, CPSC did not select this option.

Stop Thread Specification. As one alternative, CPSC could update the stop thread specification to require the use of a stop thread with the specific Tex size of the thread currently

required in the Standard. This would not create any costs since thread that meets the current Standard would meet this alternative. However, this alternative would be more restrictive than the proposed amendment by providing fewer options of stop threads. Because staff determined that the range of Tex sizes in the proposed amendment would provide comparable flammability results to the Standard, while providing a broader range of options, CPSC did not select this alternative.

Another alternative is to allow a wider range of Tex sizes, such as the full range staff assessed during flammability testing and found to yield comparable flammability results to the Standard. This would further reduce burdens on testing laboratories by providing even more options. However, staff concluded that it is more appropriate to limit the range of Tex sizes to those of cotton threads that yielded comparable flammability results to the Standard because some polyester threads are designed to be flame resistant.

Dry Cleaning Specification. In addition to the hydrocarbon alternative proposed in this NPR, CPSC considered two additional dry cleaning specifications—silicone, and butylal. As staff's testing indicates, both of these alternatives also yield comparable flammability results to the current Standard and, therefore, are likely to offer similar benefits to the hydrocarbon specification proposed. Staff identified estimated costs of the four dry cleaning solvent specifications using comparisons provided by the Toxic Use Reduction Institute (TURI). These comparisons estimate that dry cleaning with perchloroethylene involves equipment costs between \$40,000 and \$65,000 and solvent costs of \$17; dry cleaning with hydrocarbon involves equipment costs between \$38,000 and \$75,000 and solvent costs of \$14 to \$17; dry cleaning with silicone involves equipment costs between \$30,500 and \$55,000 and solvent costs of \$22 to \$28; and dry cleaning with butylal involves equipment costs between \$50,000 and \$100,000 and solvent costs of \$28 to \$34. CPSC did not select the silicone or butylal alternatives because butylal yielded slightly more different classifications than the current Standard during comparison testing; hydrocarbon is the most commonly used alternative to perchloroethylene;

hydrocarbon has a long history of use; and several companies manufacture hydrocarbon solvents for dry cleaning, whereas silicone and butylal are newer technologies and patented, making their availability more limited.

CPSC also considered requiring the use of only the hydrocarbon specification, rather than continuing to allow the use of the perchloroethylene specification in the current Standard. However, this alternative may increase costs by requiring all testing laboratories to change their dry cleaning specifications. CPSC did not select this option because, although perchloroethylene is being restricted in some locations, it is still available and widely used in the dry cleaning industry.

Laundering Specification. In addition to the LP1-2021 alternative proposed in this NPR, CPSC considered an alternative of continuing to require compliance with the laundering specification in TM 124-2006, but with a reduced agitation speed. As staff's testing indicates, this alternative also yields comparable flammability results to the current Standard and, therefore, is likely to offer similar benefits to the LP1-2021 specification proposed. However, this alternative may have higher costs than the proposed amendment because laboratory-grade washing machines are not sold pre-programmed to the reduced agitation speed settings, but they are sold pre-programmed with the LP1-2021 settings. Consequently, additional time and skilled labor resources would be necessary to program machines to meet the reduced agitation speed alternative, and there would be the potential for testing errors. CPSC did not select this option because testing laboratories are likely to already have and be familiar with LP1-2021 and have machines that comply with it since it is required for other standards and there are more washing machines on the market that meet the specifications in LP1-2021 than the reduced agitation speed parameters.

CPSC also considered amending the Standard to allow the use of LP1-2021 specifications or TM 124-2006 specifications. Similarly, CPSC considered amending the Standard to include the specifications in LP1-2021, while allowing for the continued use of TM 124-2006 for a

limited phase-out period. These alternatives would have minimal, if any, costs because they would allow testing laboratories to continue to use existing machines, while providing an option to obtain machines that are available on the market. CPSC did not select these options because this would leave CPSC unable to test for compliance in accordance with one of the procedures in the Standard when CPSC's TM 124-2006-compliance machines reach the end of their useful lives; this would retain in the Standard an outdated and obsolete specification that is no longer possible to meet with products available on the market; and staff does not have information about an appropriate phase-out period for machines that comply with TM 124-2006.

Although the CPSC did not select either of these alternatives, firms would still be able to continue to use TM 124-2006-compliant machines, instead of LP1-2021-compliant machines, under the provisions in 16 CFR 1610.40. The Commission is facilitating this option by providing, in this notice and the briefing package supporting it, the documentation necessary to support that alternative.

For dryers, CPSC considered retaining the current provisions in the Standard, which reference TM 124-2006, since dryers that meet this standard are still available on the market. This alternative would eliminate any costs associated with the proposed amendment to dryer specifications. CPSC did not select this option because requiring the use of a single standard ensures compatible washing and drying requirements and reduces confusion and costs associated with obtaining and following two separate standards. In addition, because the dryer specifications in TM 124-2006 and LP1-2021 are nearly identical, testing laboratories are unlikely to need to replace their dryers to meet the proposed amendments and, for those that do, the allowance in 16 CFR 1610.40 would mitigate or eliminate that need.

VII. Paperwork Reduction Act

This proposed rule does not involve any new information collection requirements, subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501-3521). The Standard does contain

recordkeeping provisions, but this proposed rule would not alter the estimated burden hours to establish or maintain associated records from the information collection approved previously.³⁴

VIII. Regulatory Flexibility Act Analysis³⁵

When an agency is required to publish a proposed rule, section 603 of the Regulatory Flexibility Act (5 U.S.C. 601-612) requires that the agency prepare an initial regulatory flexibility analysis (IRFA), containing specific content, that describes the impact that the proposed rule would have on small businesses and other entities. 5 U.S.C. 603(a). However, an IRFA is not required if the head of the agency certifies that the proposed rule “will not, if promulgated, have a significant economic impact on a substantial number of small entities.” 5 U.S.C. 603, 605(b). The agency must publish the certification in the *Federal Register* along with the NPR or final rule, include the factual basis for the certification, and provide the certification and statement to the Chief Counsel for Advocacy of the Small Business Administration. *Id.*³⁶

The Commission certifies that the proposed amendments, if adopted, will not have a significant economic impact on a substantial number of small entities. This is because there are little to no estimated costs associated with the rule since the proposed amendments reduce burdens on industry, maintain or expand existing requirements, or firms may rely on the allowance in 16 CFR 1610.40 to continue to use equipment that is being updated in the proposed amendments. The factual basis for the certification for this proposed rule is available in Tab F of the NPR briefing package; this section provides an overview.

A. Small Entities to Which the Rule Would Apply

The proposed rule would amend requirements for testing laboratories that test for compliance with the Standard. According to the small business size standards set by the Small

³⁴ See Office of Management and Budget (OMB) Control No. 3041-0024.

³⁵ For additional information regarding the Regulatory Flexibility Act analysis, see Tab F of the briefing package supporting this NPR.

³⁶ For additional details regarding certifications, see *A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act*, SBA Office of Advocacy (Aug. 2017), available at: <https://advocacy.sba.gov/2017/08/31/a-guide-for-government-agencies-how-to-comply-with-the-regulatory-flexibility-act/>.

Business Administration, testing laboratories are considered small if their average annual receipts are less than \$16.5 million per year. Staff estimates that 70 percent of testing laboratories would be considered small.

Staff identified a possible minimum and maximum number of testing laboratories that would be subject to the proposed rule, but notes that the upper and lower bounds of these estimates are unlikely to represent the number of impacted firms. As explained above, at a minimum, there currently are more than 300 testing laboratories that are CPSC-accepted third party laboratories that test to the Standard for purposes of children's product certifications. However, this is an underestimate of the number of firms impacted by the proposed rule because this number only includes testing laboratories that test to the Standard for children's products. Using this minimum estimate and the assumption that 70 percent are small firms, there are a minimum of 210 CPSC-accepted third party laboratories that qualify as small businesses. To identify a possible maximum, staff determined that there are a total of 7,389 testing laboratories in the United States, according to the Census Bureau. However, this is an overestimate of the number of firms impacted by the proposed rule because this number includes testing laboratories that do not test to the Standard. Using this maximum estimate and the assumption that 70 percent are small firms, there are a maximum of 5,172 small testing laboratories could theoretically be impacted by the proposed rule.

B. Criteria Supporting Certification

In considering whether certification is justified, staff established criteria for what constitutes a "significant economic impact" and a "substantial number." Staff determined that a reasonable threshold for a "significant economic impact" is costs in excess of 1 percent of the

small firm's gross annual revenue, and a "substantial number" is 20 percent or more of small domestic firms.

C. Potential Economic Impacts on Small Entities

The estimated economic impacts of the proposed rule are the same for small entities as for all firms and are discussed in section **V. Preliminary Regulatory Analysis** of this notice.

Staff does not anticipate any significant costs associated with the proposed amendments regarding burn codes because these amendments would merely clarify existing requirements. Staff does not anticipate any significant costs associated with the proposed amendments regarding stop thread or dry cleaning specifications because these amendments would continue to allow the use thread and dry cleaning under the current Standard. Staff also does not anticipate any significant costs associated with the proposed amendments regarding drying specifications because most dryers comply with both the current drying specifications and the proposed amendments, and any machines that do not comply with the amendments could be addressed through the allowance in 16 CFR 1610.40.

As discussed in the preliminary regulatory analysis, staff also does not expect significant costs associated with the proposed amendments regarding washing specifications because firms could continue to use existing machines under the allowance in 16 CFR 1610.40. In addition, any economic impact of these amendments on small firms would be offset by reducing the repair and maintenance costs to these firms to continue to use outdated machines required in the current Standard. Therefore, because there is no expected cost associated with the proposed rule, the economic impact is expected to be lower than the thresholds for "significant economic impact" and "substantial number."

However, even if small firms choose to obtain new laundering machines, rather than continue to use existing machines under the allowance in 16 CFR 1610.40, staff expects these incremental costs to be well below 1 percent of the annual revenue of a small firm. Among domestic CPSC-accepted testing laboratories that are considered small and for which data was

available, the average gross annual revenue was \$2,930,192. As such, a cost would only be a “significant economic impact” if it totaled more than \$29,301 (*i.e.*, 1 percent of the small firm’s gross annual revenue). Staff estimates that acquiring a washing machine that complies with LP1-2021 is \$4,300, minus \$300 for the cost of maintaining a washing machine that complies with TM 124-2006, for a total incremental cost of \$4,000. Staff assumes that testing laboratories each have three washing machines to test to the Standard. Thus, even replacing all three washing machines would result in a total cost of approximately \$12,000 and would not constitute a “significant economic impact” for small entities. Staff does not expect all small entities to replace their washing machines, as some may use the allowance in 16 CFR 1610.40 to continue to use their existing machines. As such, a “substantial number” of small entities would not have significant economic impacts, even if they choose to upgrade their machines.

D. Assumptions and Uncertainties

Assumptions and uncertainties regarding the number of small entities affected by the proposed rule are discussed above. Assumptions and uncertainties regarding staff’s assessment of the impact of the proposed rule on small entities are described in section **V. Preliminary Regulatory Analysis** of this notice.

E. Request for Comments

The Commission requests comments on the certification, the factual basis for it, the threshold economic analysis, and the underlying assumptions and uncertainties.

IX. Incorporation by Reference

The proposed rule incorporates by reference LP1-2021. The Office of the Federal Register (OFR) has regulations regarding incorporation by reference. 1 CFR part 51. Under these regulations, in the preamble of the NPR, an agency must summarize the incorporated material, and discuss the ways in which the material is reasonably available to interested parties or how the agency worked to make the materials reasonably available. 1 CFR 51.5(a). In accordance

with the OFR requirements, this preamble summarizes the provisions of LP1-2021 that the Commission proposes to incorporate by reference.

The standard is reasonably available to interested parties and interested parties can purchase a copy of LP1-2021 from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, North Carolina 27709; telephone (919) 549-8141; www.aatcc.org. Additionally, during the NPR comment period, a copy of LP1-2021 is available for viewing on AATCC's website at: <https://members.aatcc.org/store/lp001/2212/>. Once a final rule takes effect, a read-only copy of the standard will be available for viewing on the AATCC website. Interested parties can also schedule an appointment to inspect a copy of the standard at CPSC's Office of the Secretary, U.S. Consumer Product Safety Commission, 4330 East West Highway, Bethesda, MD 20814, telephone: 301-504-7479; e-mail: cpsc-os@cpsc.gov.

X. Testing, Certification, and Notice of Requirements

Because the Standard applies to clothing and textiles intended to be used for clothing, it applies to both non-children's products and children's products. Section 14(a) of the Consumer Product Safety Act (CPSA; 15 U.S.C. 2051-2089) includes requirements for testing and certifying that non-children's products and children's products comply with applicable mandatory standards issued under any statute the Commission administers, including the FFA. 15 U.S.C. 2063(a). The Commission's regulations on certificates of compliance are codified at 16 CFR part 1110.

Section 14(a)(1) addresses required testing and certifications for non-children's products and requires every manufacturer of a non-children's product, which includes the importer,³⁷ that is subject to a rule enforced by the Commission and imported for consumption or warehousing or distributed in commerce, to issue a certificate. The manufacturer must certify, based on a test of each product or upon a reasonable testing program, that the product complies with all rules, bans,

³⁷ The CPSA defines a "manufacturer" as "any person who manufactures or imports a consumer product." 15 U.S.C. 2052(a)(11).

standards, or regulations applicable to the product under statutes enforced by the Commission. The certificate must specify each such rule, ban, standard, or regulation that applies to the product. 15 U.S.C. 2063(a)(1).

Sections 14(a)(2) and (a)(3) address testing and certification requirements specific to children's products. A "children's product" is a consumer product that is "designed or intended primarily for children 12 years of age or younger." 15 U.S.C. 2052(a)(2). The CPSA and CPSC's regulations provide factors to consider when determining whether a product is a children's product. 15 U.S.C. 2052(a)(2); 16 CFR 1200.2. An accredited third party conformity assessment body (third-party lab) must test any product that is subject to a children's product safety rule³⁸ for compliance with the applicable rule. 15 U.S.C. 2063(a)(2)(A). After this testing, the manufacturer or private labeler of the product must certify that, based on the third-party lab's testing, the product complies with the children's product safety rule. *Id.* 2063(a)(2)(B).

The Commission must publish a notice of requirements (NOR) for third-party labs to obtain accreditation to assess conformity with a children's product safety rule. *Id.* 2063(a)(3)(A). The Commission must publish an NOR for new or revised children's products standards not later than 90 days before such rules or revisions take effect. *Id.* 2063(a)(3)(B)(vi). The Commission previously published an NOR for the Standard.³⁹ The NOR provided the criteria and process for CPSC to accept accreditation of third-party labs for testing products to 16 CFR part 1610. Part 1112 provides requirements for third-party labs to obtain accreditation to test for conformance with a children's product safety rule, including the Standard. 16 CFR 1112.15(b)(20).

The proposed rule does not require third-party labs to change the way they test products for compliance with the Standard. The proposed amendments to burn codes do not alter test protocols; they merely clarify existing requirements. The proposed amendments regarding stop

³⁸ The Commission has previously stated that because the definition of "children's product safety rule" in section 14(f)(1) of the CPSA includes any consumer product safety rule issued under any statute enforced by the Commission, third-party testing is required to support a certification under the Standard since the Standard applies to children's products as well as non-children's products. *See* 77 FR 31086, 31105 (May 24, 2012).

³⁹ *See* 75 FR 51016 (Aug. 18, 2010), amended at 76 FR 22608 (Apr. 22, 2011); 78 FR 15836 (Mar. 12, 2013).

thread and dry cleaning specifications continue to allow the use of the specifications that comply with the current Standard. Although the proposed amendments regarding laundering specifications differ from the current Standard, 16 CFR 1610.40 provides an allowance for the continued use of laundering specifications under the current Standard. Accordingly, if the Commission issues a final rule, the existing accreditations that the Commission has accepted for testing to the Standard would cover testing to the revised Standard, and CPSC-accepted third party conformity assessment bodies would be expected to update the scope of their accreditations to reflect the revised Standard in the normal course of renewing their accreditations.

Accordingly, the Commission does not propose to revise the NOR for testing to the Standard.

The Commission seeks comments on this assessment and implications of the proposed rule on testing and certifications.

XI. Environmental Considerations

The Commission's regulations address whether CPSC is required to prepare an environmental assessment (EA) or an environmental impact statement (EIS). 16 CFR 1021.5. Those regulations list CPSC actions that "normally have little or no potential for affecting the human environment," and, therefore, fall within a "categorical exclusion" under the National Environmental Policy Act (42 U.S.C. 4231-4370h) and the regulations implementing it (40 CFR parts 1500 through 1508) and do not require an EA or EIS. 16 CFR 1021.5(c). Among those actions are rules that provide design or performance requirements for products, or revisions to such rules. *Id.* 1021.5(c)(1). Because this proposed rule would make minimal revisions to the equipment and materials used for flammability testing in the Standard, and make minor revisions for clarity, the proposed rule falls within the categorical exclusion, and thus, no EA or EIS is required.

XII. Preemption

Executive Order (EO) 12988, *Civil Justice Reform* (Feb. 5, 1996), directs agencies to specify the preemptive effect of a regulation. 61 FR 4729 (Feb. 7, 1996), section 3(b)(2)(A). In accordance with EO 12988, CPSC states the preemptive effect of the proposed rule, as follows:

The proposed revision to the Standard for the Flammability of Clothing Textiles falls under the authority of the FFA. Section 16 of the FFA provides that “whenever a flammability standard or other regulation for a fabric, related material, or product is in effect under this Act, no State or political subdivision of a State may establish or continue in effect a flammability standard or other regulation for such fabric, related material or product if the standard or other regulation is designed to protect against the same risk of occurrence of fire with respect to which the standard or other regulation under this Act is in effect unless the State or political subdivision standard or other regulation is identical to the Federal standard or other regulation.” 15 U.S.C. 1203(a). The Federal Government, or a state or local government, may establish or continue in effect a non-identical requirement for its own use that is designed to protect against the same risk as the CPSC standard if the Federal, state, or local requirement provides a higher degree of protection than the CPSC requirement. *Id.* 1203(b). In addition, states or political subdivisions of a state may apply for an exemption from preemption regarding a flammability standard or other regulation applicable to a fabric, related material, or product subject to a standard or other regulation in effect under the FFA. Upon such application, the Commission may issue a rule granting the exemption if it finds that: (1) compliance with the state or local standard would not cause the fabric, related material, or product to violate the Federal standard; (2) the state or local standard provides a significantly higher degree of protection from the risk of occurrence of fire than the CPSC standard; and (3) the state or local standard does not unduly burden interstate commerce. *Id.* 1203(c).

XIII. Effective Date

Section 4(b) of the FFA specifies that an amendment to a flammability standard shall take effect 12 months after the date the amendment is promulgated unless the Commission finds, for

good cause shown, that an earlier or later effective date is in the public interest and publishes the reasons for that finding. 15 U.S.C. 1193(b).

The Commission proposes that the amendments to the Standard take effect 6 months after publication of the final rule in the **Federal Register**. However, the Commission seeks comments on whether a different effective date is justified and, if so, the appropriate date and justification for it. The Commission preliminarily finds that this shorter effective date is in the public interest because the Standard provides an important safety benefit and the proposed amendments would provide some improvement to those benefits, with little to no costs. Moreover, a shorter effective date is justified given that the proposed amendments should have minimal impacts, improve clarity, and relieve burdens; that the prohibition on the use of perchloroethylene in dry cleaning in California will take effect in January 2023; and that washing machines that meet the Standard are no longer available.

Section 4(b) of the FFA also requires that an amendment of a flammability standard exempt fabrics, related materials, and products “in inventory or with the trade” on the date the amendment becomes effective, unless the Commission prescribes, limits, or withdraws that exemption because it finds that the product is “so highly flammable as to be dangerous when used by consumers for the purpose for which it is intended.” Because the proposed amendments are intended to have minimal impacts, the Commission proposes that products “in inventory or with the trade” on the date the amendment becomes effective be exempt from the amended Standard.

XIV. Proposed Findings

As discussed in section **II. Statutory Provisions**, above, the FFA requires the Commission to make certain findings when it issues or amends a flammability standard. 15 U.S.C. 1193(b), (j)(2). This section discusses preliminary support for those findings.

The amendments are needed to adequately protect the public against unreasonable risk of fire leading to death, injury, or significant property damage. Since the requirements in the

Standard were promulgated in 1953, industry practices, equipment, materials, and procedures have evolved, making some parts of the Standard outdated, unavailable, or unclear. Because the Standard determines whether a fabric is safe for use in clothing, it is necessary to replace outdated and unavailable equipment, materials, and procedures and clarify unclear provisions, to ensure that flammability testing can be performed and that the results of the testing yield consistent, reliable, and accurate flammability classifications to ensure that dangerously flammable fabrics are not used in clothing.

The amendments are reasonable, technologically practicable, and appropriate, and are stated in objective terms. The amendments reflect clarifications that industry members requested, streamline existing requirements, and update outdated equipment, materials, and procedures. The proposed amendments reflect changes recommended by industry members, and allow for the use of equipment, materials, and procedures that are commonly used by industry members, recognized in standards developed by industry, and are readily available, and stated in objective terms.

The amendments are limited to fabrics, related materials, and products that present an unreasonable risk. The proposed amendments do not alter the textiles or products that are subject to the Standard, which addresses products that present an unreasonable risk.

Voluntary standards. CPSC identified four relevant voluntary standards. AATCC Test Method 124-2018, *Appearance of Fabrics after Repeated Home Laundering*, includes provisions that are relevant to flammability testing and is similar to portions of the Standard, but is not a flammability standard. Rather, it is intended to evaluate the smoothness appearance of fabrics after repeated home laundering. As such, it contains provisions that are not relevant to flammability testing and lacks provisions that are necessary for flammability testing. AATCC's Laboratory Procedure 1-2021, *Home Laundering: Machine Washing*, also includes provisions that are relevant to flammability testing and is similar to portions of the Standard but is not a flammability standard. Rather, it is intended as a stand-alone laundering protocol, for use with

other test methods, such as a flammability standard. Therefore, it contains provisions that are not relevant to flammability testing and lacks provisions that are necessary for flammability testing. ASTM D1230-22, *Standard Test Method for Flammability of Apparel Textiles*, is similar to the Standard, but contains different laundering specifications, terminology, and burn codes, and it does not address issues identified in this proposed rule, such as clarification of the stop thread specification. Canadian General Standards Board Standard CAN/CGSB-4.2 No. 27.5, *Textile Test Method Flame Resistance - 45° Angle Test – One-Second Flame Impingement*, also is similar to the Standard, but includes several differences from longstanding provisions in the Standard, such as stop thread specifications. Compliance with these voluntary standards is not likely to result in the elimination or adequate reduction of the risk of injury identified by the Commission. The proposed amendments will provide better clarity and updates than these voluntary standards and, therefore, better address the risk of injury.

Relationship of benefits to costs. Because the proposed amendments reflect current industry practices and provide needed clarifications, the anticipated benefits and costs are expected to be small and bear a reasonable relationship to each other.

Least burdensome requirement. The proposed amendments do not substantively change the Standard but provide changes that are necessary for clarity and so that testing laboratories may obtain necessary materials and equipment to conduct testing. Several proposed amendments expand the permissible range of materials or equipment to reduce burdens. For revisions that include new equipment or materials, the proposed amendments either provide these new equipment and materials as additional alternatives, or the Commission provides information to support the continued use of equipment or materials in the current Standard under 16 CFR 1610.40.

XV. Request for Comments

The Commission requests comments on all aspects of the proposed rule. Comments should be submitted in accordance with the instructions in the **ADDRESSES** section at the

beginning of this notice. The following are specific comment topics that the Commission would find particularly helpful:

- Burn Codes:
 - The proposed amendments to the test result code provisions, whether they improve clarity, and whether additional revisions are necessary;
- Stop Thread:
 - The proposed revisions to the stop thread specification and whether additional revisions are necessary and why;
 - The equivalency of the proposed revisions and information and data supporting such comments;
 - The use of Tex size as part of the stop thread specification, as well as the appropriate size and range and justifications for them;
 - Alternatives to the proposed revisions, along with information and data supporting them;
- Comparison Testing:
 - The comparison testing supporting this NPR, including the fabrics selected, test methods, results, and conclusions regarding comparability to the Standard;
- Dry Cleaning Specifications:
 - The proposed revisions to the dry cleaning specifications;
 - The equivalency of the proposed revisions and information and data supporting such comments;
 - Whether perchloroethylene should be retained as an option in the Standard;
 - Whether hydrocarbon solvent should be the alternative provided, or whether other options should be provided instead of or in addition to hydrocarbon and, if so, information, data, and justifications for doing so;
- Washing Specifications:

- The proposed revisions to the washing specifications;
- The equivalency of the proposed revisions and information and data supporting such comments;
- Whether TM 124-2006 should be retained as an option in the Standard and, if so, for how long and the justifications for doing so;
- Additional alternatives, including reduced agitation speed and TM 124-2018, and other appropriate alternatives, along with information, data, and justifications for such alternatives;
- The allowance in 16 CFR 1610.40 and its utility for the continued use of washing specifications required in the current Standard;
- Drying Specifications:
 - The proposed revisions to the drying specifications;
 - The equivalency of the proposed revisions and information and data supporting such comments;
 - Whether TM 124-2006 should be retained as an option in the Standard and, if so, for how long and the justifications for doing so;
 - Additional alternatives, including TM 124-2018 or the use of different standards for washing and drying, and other appropriate alternatives, along with information, data, and justifications for such alternatives;
 - The allowance in 16 CFR 1610.40 and its utility for the continued use of drying specifications required in the current Standard;
- Effective Date:
 - The reasonableness of the proposed effective date, and recommendations and justifications for a different effective date;

- The reasonableness of the proposed effective date for the amendments regarding burn codes and stop thread, and whether another effective date would be in the public interest, and why;
- The reasonableness of the proposed effective date for the amendments regarding dry cleaning, and whether a shorter effective date would be in the public interest, particularly given the prohibition on the use of perchloroethylene in certain locations, beginning in 2023;
- The reasonableness of the proposed effective date for the amendments regarding laundering, including whether labs will need to obtain new machines and the time needed to obtain and test with new machines;
- Economic Analyses:
 - The accuracy of the estimated benefits associated with the proposed rule, and whether additional benefits should be considered, particularly for testing laboratories that are affected by restrictions on dry cleaning and the market availability of laundering equipment;
 - The accuracy of the estimated costs associated with the proposed rule, and whether additional costs should be considered, particularly for testing laboratories that maintain, use, or need new laundering equipment to test to the Standard;
 - Information and data regarding the benefits and costs associated with the proposed rule;
 - The number of firms that would be impacted by the proposed rule and the extent to which they would be impacted;
 - The number of small entities that would be impacted by the proposed rule and the benefits and costs to them; and
 - The alternatives to the proposed rule and the benefits and costs associated with them.

Consistent with the FFA requirement to provide interested parties with an opportunity to make oral presentations of data, views, or arguments, the Commission requests that anyone who would like to make an oral presentation concerning this rulemaking contact CPSC's Office of the Secretary (contact information is provided in the **ADDRESSES** section of this notice) within 45 days of publication of this notice. If the Commission receives requests to make oral comments, a date will be set for a public meeting for that purpose and notice of the meeting will be provided in the **Federal Register**.

XVI. Conclusion

For the reasons stated in this preamble, the Commission proposes to amend the Standard for the Flammability of Clothing Textiles.

List of Subjects

16 CFR Part 1610

Clothing, Consumer protection, Flammable materials, Incorporation by reference, Reporting and recordkeeping requirements, Textiles, Warranties.

For the reasons discussed in the preamble, the Commission proposes to amend title 16 of the Code of Federal Regulations by revising part 1610 to read as follows:

PART 1610—STANDARD FOR THE FLAMMABILITY OF CLOTHING TEXTILES

1. The authority citation for part 1610 continues to read as follows:

Authority: 15 U.S.C. 1191-1204.

2. Amend § 1610.2 by revising paragraphs (a) and (p) to read as follows:

§ 1610.2 Definitions.

* * * * *

(a) *Base burn* (also known as base fabric ignition or fusing) means the point at which the flame burns the ground (base) fabric of a raised surface textile fabric and provides a self-sustaining flame. Base burns, used to establish a Class 2 or 3 fabric, are those burns resulting from surface flash that occur on specimens in places other than the point of impingement (test

result code SFBB) when the warp and fill yarns of a raised surface textile fabric undergo combustion. Base burns can be identified by an opacity change, scorching on the reverse side of the fabric, or when a physical hole is evident.

* * * * *

(p) *Stop thread supply* means 3-ply, white, mercerized, 100% cotton sewing thread, with a Tex size of 35 to 45.

* * * * *

3. Amend § 1610.4 by revising paragraphs (a)(2), (b)(2), (c)(2), and Table 1 to read as follows:

§ 1610.4 Requirements for classifying textiles.

(a) * * *

(2) *Raised surface textile fabric.* Such textiles in their original state and/or after being refurbished as described in § 1610.6(a) and (b), when tested as described in § 1610.6, shall be classified as Class 1, Normal flammability, when the burn time is more than 7.0 seconds, or when they burn with a rapid surface flash (0.0 to 7.0 seconds), provided the intensity of the flame is so low as not to ignite or fuse the base fabric.

(b) * * *

(2) *Raised surface textile fabric.* Such textiles in their original state and/or after being refurbished as described in § 1610.6(a) and (b), when tested as described in § 1610.6, shall be classified as Class 2, Intermediate flammability, when the burn time is from 4.0 through 7.0 seconds, both inclusive, and the base fabric starts burning at places other than the point of impingement as a result of the surface flash (test result code SFBB).

(c) * * *

(2) *Raised surface textile fabric.* Such textiles in their original state and/or after refurbishing as described in § 1610.6(a) and § 1610.6(b), when tested as described in § 1610.6, shall be classified as Class 3 Rapid and Intense Burning when the time of flame spread is less than 4.0

seconds, and the base fabric starts burning at places other than the point of impingement as a result of the surface flash (test result code SFBB).

Table 1 to § 1610.4 – Summary of Test Criteria for Specimen Classification

[See § 1610.7]

Class	Plain surface textile fabric	Raised surface textile fabric
1	Burn time is 3.5 seconds or more. ACCEPTABLE (3.5 seconds is a pass)	(1) Burn time is greater than 7.0 seconds; or (2) Burn time is less than or equal to 7.0 seconds with no SFBB test result code. Exhibits rapid surface flash only. ACCEPTABLE – Normal Flammability
2	Class 2 is not applicable to plain surface textile fabrics.	Burn time is 4.0 to 7.0 seconds (inclusive) with base burn (SFBB). ACCEPTABLE – Intermediate Flammability
3	Burn time is less than 3.5 seconds. NOT ACCEPTABLE	Burn time is less than 4.0 seconds with base burn (SFBB). NOT ACCEPTABLE – Rapid and Intense Burning

Note: SFBB poi and SFBB poi* are not considered a base burn for determining Class 2 and 3 fabrics.

4. Amend § 1610.5 by revising paragraphs (a)(2)(ii), (b)(6) and (7) to read as follows:

§ 1610.5 Test apparatus and materials.

(a) * * *

(2) * * *

(ii) *Stop thread supply*. This supply, consisting of a spool of 3-ply, white, mercerized, 100% cotton sewing thread, with a Tex size of 35 to 45 Tex, shall be fastened to the side of the chamber and can be withdrawn by releasing the thumbscrew holding it in position.

* * * * *

(b) * * *

(6) *Commercial dry cleaning machine*. The commercial dry cleaning machine shall be capable of providing a complete automatic dry-to-dry cycle using perchloroethylene solvent or hydrocarbon solvent and a cationic dry cleaning detergent as specified in § 1610.6(b)(1)(i).

(7) *Dry cleaning solvent*. The solvent shall be perchloroethylene, commercial grade, or hydrocarbon solvent, commercial grade.

* * * * *

5. Amend § 1610.6 by revising paragraphs (b)(1)(i)(A), (B)(1)(ii) and (iii) to read as follows:

§ 1610.6 Test procedure.

* * * * *

(b) * * *

(1) * * *

(i) * * *

(A) All samples shall be dry cleaned before they undergo the laundering procedure.

Samples shall be dry cleaned in a commercial dry cleaning machine, using one of the following prescribed conditions:

(1) For perchloroethylene:

(i) Solvent: Perchloroethylene, commercial grade.

(ii) Detergent class: Cationic.

(iii) Cleaning time: 10-15 minutes.

(iv) Extraction time: 3 minutes.

(v) Drying Temperature: 60-66°C (140-150°F).

(vi) Drying Time: 18-20 minutes.

(vii) Cool Down/Deodorization time: 5 minutes.

(2) For hydrocarbon:

(i) Solvent: Hydrocarbon.

(ii) Detergent Class: Cationic.

(iii) Cleaning Time: 20-25 minutes.

(iv) Extraction Time: 4 minutes.

(v) Drying Temperature: 60-66°C (140-150°F).

(vi) Drying Time: 20-25 minutes.

(vii) Cool Down/Deodorization Time: 5 minutes.

Samples shall be dry cleaned in a load that is 80% of the machine's capacity.

(B) * * *

(ii) *Laundering procedure.* The sample, after being subjected to the dry cleaning procedure, shall be washed and dried one time in accordance with section 9.2, section 9.4, section 12.2(A), Table I “(1) Normal,” “(IV) Hot,” and Table VI “(Aiii) Permanent Press” of AATCC LP1-2021, “Laboratory Procedure for Home Laundering: Machine Washing” (incorporated by reference, see § 1610.6(b)(1)(iii)). Washing shall be performed in accordance with the detergent (powder) specified in section 9.4 of AATCC LP1-2021; parameters for water level, agitator speed, stroke length, washing time, spin speed, spin time, and wash temperature specified in Table I, “Standard Washing Machine Parameters,” “(1) Normal” and “(IV) Hot” of AATCC LP1-2021; and a maximum wash load as specified in section 9.2 of AATCC LP1-2021, which may consist of any combination of test samples and dummy pieces. Drying shall be performed in accordance with section 12.2(A) of AATCC LP1-2021, Tumble Dry, using the exhaust temperature and cool down time specified in Table VI, “Standard Tumble Dryer Parameters,” “(Aiii) Permanent Press” of AATCC LP1-2021.

(iii) AATCC LP1-2021, “Laboratory Procedure for Home Laundering: Machine Washing,” is incorporated by reference. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. A read-only copy of the standard is available for viewing on the AATCC website. You may obtain a copy from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, North Carolina 27709; telephone (919) 549-8141; www.aatcc.org. You may inspect a copy at the Division of the Secretariat, U.S. Consumer Product Safety Commission, Room 820, 4330 East West Highway, Bethesda, MD 20814, telephone (301) 504-7479, e-mail cpsc-os@cpsc.gov, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, e-mail fr.inspection@nara.gov, or go to: www.archives.gov/federal-register/cfr/ibr-locations.html.

* * * * *

6. Amend § 1610.7 by revising paragraph (b) to read as follows:

§ 1610.7 Test sequence and classification criteria.

* * * * *

(b) *Test sequence and classification criteria.* (1) Step 1, Plain Surface Textile Fabrics in the original state.

(i) Conduct preliminary tests in accordance with § 1610.6(a)(2)(i) to determine the fastest burning direction of the fabric.

(ii) Prepare and test five specimens from the fastest burning direction. The burn times determine whether to assign the preliminary classification and proceed to § 1610.6(b) or to test five additional specimens.

(iii) Assign the preliminary classification of Class 1, Normal Flammability and proceed to § 1610.6(b) when:

(A) There are no burn times; or

(B) There is only one burn time, and it is equal to or greater than 3.5 seconds; or

(C) The average burn time of two or more specimens is equal to or greater than 3.5 seconds.

(iv) Test five additional specimens when there is either only one burn time, and it is less than 3.5 seconds; or there is an average burn time of less than 3.5 seconds. Test these five additional specimens from the fastest burning direction as previously determined by the preliminary specimens. The burn times for the 10 specimens determine whether to:

(A) Stop testing and assign the final classification as Class 3, Rapid and Intense Burning only when there are two or more burn times with an average burn time of less than 3.5 seconds; or

(B) Assign the preliminary classification of Class 1, Normal Flammability and proceed to § 1610.6(b) when there are two or more burn times with an average burn time of 3.5 seconds or greater.

(v) If there is only one burn time out of the 10 test specimens, the test is inconclusive. The fabric cannot be classified.

(2) Step 2, Plain Surface Textile Fabrics after refurbishing in accordance with § 1610.6(b)(1).

(i) Conduct preliminary tests in accordance with § 1610.6(a)(2)(i) to determine the fastest burning direction of the fabric.

(ii) Prepare and test five specimens from the fastest burning direction. The burn times determine whether to stop testing and assign the preliminary classification or to test five additional specimens.

(iii) Stop testing and assign the preliminary classification of Class 1, Normal Flammability, when:

- (A) There are no burn times; or
- (B) There is only one burn time, and it is equal to or greater than 3.5 seconds; or
- (C) The average burn time of two or more specimens is equal to or greater than 3.5 seconds.

(iv) Test five additional specimens when there is only one burn time, and it is less than 3.5 seconds; or there is an average burn time less than 3.5 seconds. Test five additional specimens from the fastest burning direction as previously determined by the preliminary specimens. The burn times for the 10 specimens determine the preliminary classification when:

(A) There are two or more burn times with an average burn time of 3.5 seconds or greater. The preliminary classification is Class 1, Normal Flammability; or

(B) There are two or more burn times with an average burn time of less than 3.5 seconds. The preliminary and final classification is Class 3, Rapid and Intense Burning; or

(v) If there is only one burn time out of the 10 specimens, the test results are inconclusive. The fabric cannot be classified.

(3) Step 1, Raised Surface Textile Fabric in the original state.

(i) Determine the area to be most flammable per § 1610.6(a)(3)(i).

(ii) Prepare and test five specimens from the most flammable area. The burn times and visual observations determine whether to assign a preliminary classification and proceed to § 1610.6(b) or to test five additional specimens.

(iii) Assign the preliminary classification and proceed to § 1610.6(b) when:

(A) There are no burn times. The preliminary classification is Class 1, Normal Flammability; or

(B) There is only one burn time and it is less than 4.0 seconds without an SFBB test result code, or it is 4.0 seconds or greater with or without an SFBB test result code. The preliminary classification is Class 1, Normal Flammability; or

(C) There are no base burns (SFBB) regardless of the burn time(s). The preliminary classification is Class 1, Normal Flammability; or

(D) There are two or more burn times with an average burn time of 0.0 to 7.0 seconds with a surface flash only. The preliminary classification is Class 1, Normal Flammability; or

(E) There are two or more burn times with an average burn time greater than 7.0 seconds with any number of base burns (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(F) There are two or more burn times with an average burn time of 4.0 through 7.0 seconds (both inclusive) with no more than one base burn (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(G) There are two or more burn times with an average burn time less than 4.0 seconds with no more than one base burn (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(H) There are two or more burn times with an average burn time of 4.0 through 7.0 seconds (both inclusive) with two or more base burns (SFBB). The preliminary classification is Class 2, Intermediate Flammability.

(iv) Test five additional specimens when the tests of the initial five specimens result in either of the following: There is only one burn time and it is less than 4.0 seconds with a base burn (SFBB); or the average of two or more burn times is less than 4.0 seconds with two or more base burns (SFBB). Test these five additional specimens from the most flammable area. The burn times and visual observations for the 10 specimens will determine whether to:

(A) Stop testing and assign the final classification only if the average burn time for the 10 specimens is less than 4.0 seconds with three or more base burns (SFBB). The final classification is Class 3, Rapid and Intense Burning; or

(B) Assign the preliminary classification and continue on to § 1610.6(b) when:

(1) The average burn time is less than 4.0 seconds with no more than two base burns (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(2) The average burn time is 4.0 to 7.0 seconds (both inclusive) with no more than 2 base burns (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(3) The average burn time is greater than 7.0 seconds. The preliminary classification is Class 1, Normal Flammability; or

(4) The average burn time is 4.0 to 7.0 seconds (both inclusive) with three or more base burns (SFBB). The preliminary classification is Class 2, Intermediate Flammability; or

(v) If there is only one burn time out of the 10 specimens, the test is inconclusive. The fabric cannot be classified.

(4) Step 2, Raised Surface Textile Fabric After Refurbishing in accordance with § 1610.6(b).

(i) Determine the area to be most flammable in accordance with § 1610.6(a)(3)(i).

(ii) Prepare and test five specimens from the most flammable area. Burn times and visual observations determine whether to stop testing and determine the preliminary classification or to test five additional specimens.

(iii) Stop testing and assign the preliminary classification when:

(A) There are no burn times. The preliminary classification is Class 1, Normal Flammability; or

(B) There is only one burn time, and it is less than 4.0 seconds without an SFBB test result code; or it is 4.0 seconds or greater with or without an SFBB test result code. The preliminary classification is Class 1, Normal Flammability; or

(C) There are no base burns (SFBB) regardless of the burn time(s). The preliminary classification is Class 1, Normal Flammability; or

(D) There are two or more burn times with an average burn time of 0.0 to 7.0 seconds with a surface flash only. The preliminary classification is Class 1, Normal Flammability; or

(E) There are two or more burn times with an average burn time greater than 7.0 seconds with any number of base burns (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(F) There are two or more burn times with an average burn time of 4.0 to 7.0 seconds (both inclusive) with no more than one base burn (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(G) There are two or more burn times with an average burn time less than 4.0 seconds with no more than one base burn (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(H) There are two or more burn times with an average burn time of 4.0 to 7.0 seconds (both inclusive) with two or more base burns (SFBB). The preliminary classification is Class 2, Intermediate Flammability.

(iv) Test five additional specimens when the tests of the initial five specimens result in either of the following: There is only one burn time, and it is less than 4.0 seconds with a base burn (SFBB); or the average of two or more burn times is less than 4.0 seconds with two or more base burns (SFBB).

(v) If required, test five additional specimens from the most flammable area. The burn times and visual observations for the 10 specimens determine the preliminary classification when:

(A) The average burn time is less than 4.0 seconds with no more than two base burns (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(B) The average burn time is less than 4.0 seconds with three or more base burns (SFBB). The preliminary and final classification is Class 3, Rapid and Intense Burning; or

(C) The average burn time is greater than 7.0 seconds. The preliminary classification is Class 1, Normal Flammability; or

(D) The average burn time is 4.0 to 7.0 seconds (both inclusive), with no more than two base burns (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(E) The average burn time is 4.0 to 7.0 seconds (both inclusive), with three or more base burns (SFBB). The preliminary classification is Class 2, Intermediate Flammability; or

(vi) If there is only one burn time out of the 10 specimens, the test is inconclusive. The fabric cannot be classified.

7. Amend § 1610.8 by revising paragraph (b) to read as follows:

§ 1610.8 Reporting results.

* * * * *

(b) *Test result codes.* The following are definitions for the test result codes, which shall be used for recording flammability results for each specimen that is burned.

(1) For Plain Surface Textile Fabrics:

(i) DNI Did not ignite.

(ii) IBE Ignited, but extinguished.

(iii) __. __ sec. Actual burn time measured and recorded by the timing device.

(2) For Raised Surface Textile Fabrics:

(i) SF ntr Surface flash, does not break the stop thread. No time recorded.

(ii) __. __ SF only Time in seconds, surface flash only. No damage to the base fabric.

(iii) __. __ SFBB Time in seconds, surface flash base burn starting at places other than the point of impingement as a result of surface flash.

(iv) __. __ SFBB poi Time in seconds, surface flash base burn starting at the point of impingement.

(v) __. __ SFBB poi* Time in seconds, surface flash base burn possibly starting at the point of impingement. The asterisk is accompanied by the following statement: "Unable to make absolute determination as to source of base burns." This statement is added to the result of any specimen if there is a question as to origin of the base burn.

Alberta E. Mills,

Secretary,

Consumer Product Safety Commission.

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